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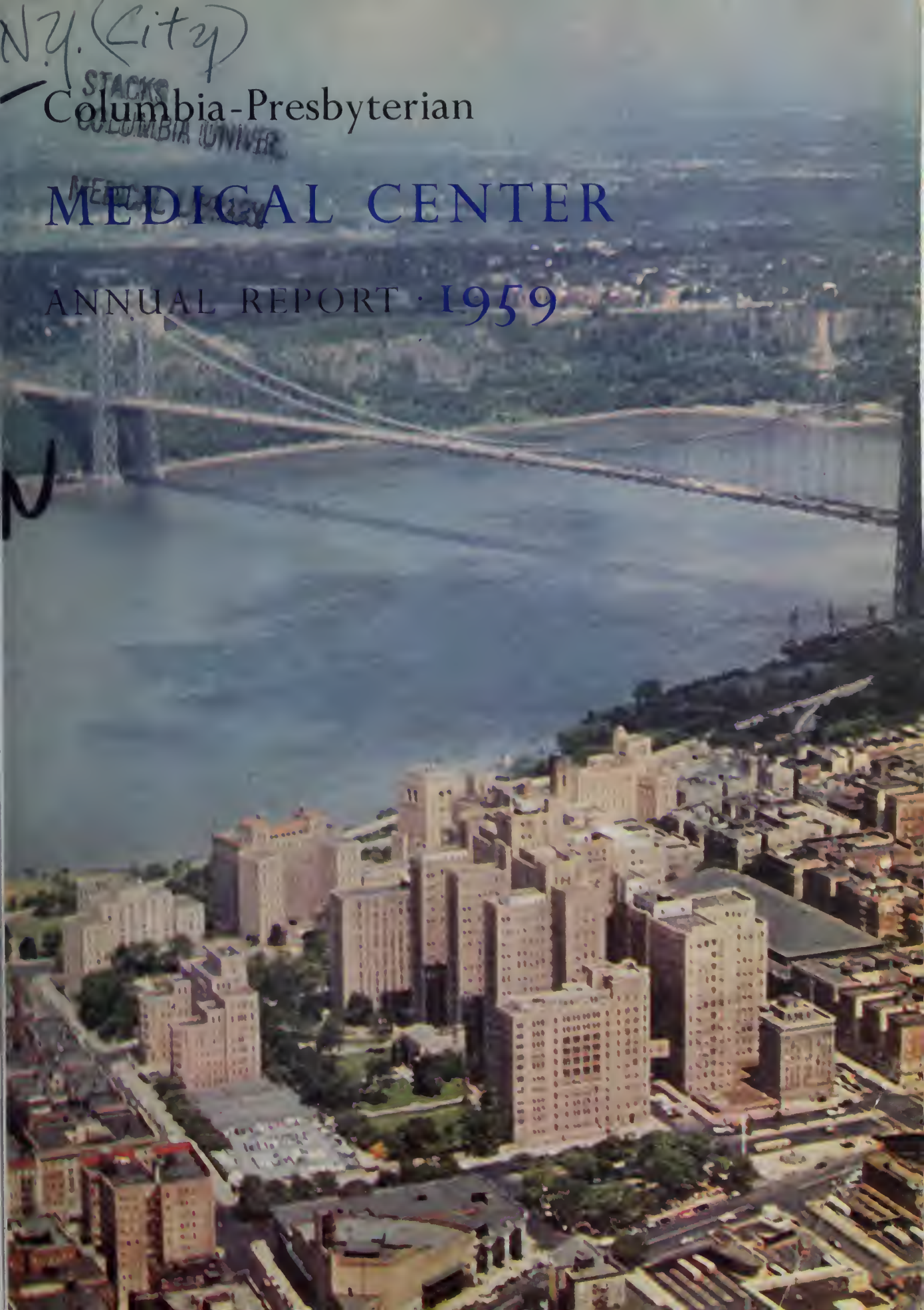
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STACKS
COLUMBIA UNIVER
Columbia-Presbyterian

MEDICAL CENTER

ANNUAL REPORT · 1959



FIRST COMBINED REPORT

of the

COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York 32, N. Y.



College of Physicians and Surgeons • Columbia University
in the City of New York

and

The Presbyterian Hospital in the City of New York

December 31, 1959

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This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who prepare to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Medical Center and College, who give life and breath to this concept.

"Those who serve" include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in care of the patient today and contribute toward advancement in health and medical science tomorrow.

Sixteen pages illustrate some activities required in providing care for 128,000 patients who each year are treated in the hospitals, clinics and doctors' offices of the Medical Center.

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Origin and Functions of the Medical Center

The Medical Center comprises a group of long established hospitals of high standing which, in affiliation with the College of Physicians and Surgeons of Columbia University, furnish an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began at King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons be-

came the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928 the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital. In 1945, the medical faculty was made responsible for the educational programs in Medicine, Dental and Oral Surgery, Public Health, and Nursing.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The Presbyterian Hospital in the City of New York is the corporate title for all the voluntary hospitals and clinics at The Columbia-Presbyterian Medical Center. Some 138,000 patients a year are cared for in the hospitals, clinics, and doctors' offices of the Medical Center. The group consists of the following units:

The Presbyterian Hospital

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison and Park Avenues between 70th and 71st Streets. On April 25, 1911, Presbyterian Hospital made its original arrangement with Columbia University's College of Physicians and Surgeons for

coordinating the care of the sick with the educational and research program of the University. Now Presbyterian Hospital is the largest single unit of the Medical Center. The Hospital occupies a 22-story building in which are the wards of the Medical and Surgical Services, Obstetrical and Gynecological Service, Urological Service, Ear, Nose and Throat Service, Dermatological Service and the Orthopedic Surgery Service.

Babies Hospital

Babies Hospital, 167th Street and Broadway, founded in 1887, provides for general medical and surgical care of infants and children up to their thirteenth birthday, and care for premature babies. The total capacity of the Hospital is 196. One floor is devoted to the care of private and semi-private patients. Both outdoor and indoor playrooms are provided for convalescent children. Laboratories are operated for the diagnostic and research work of the Hospital in pathology, microbiology and chemistry. An X-ray and fluoroscopic department is operated under the direction of the Hospital radiologist. An outpatient department is maintained in Vanderbilt Clinic by the attending and house staff of the Hospital. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

Harkness Pavilion

Harkness Pavilion, 180 Fort Washington Avenue, erected when the Medical Center was established in 1928, is available for the accommodation of 300 adult private patients of the attending staff.

The Mary Harkness Convalescent Home

Mary Harkness Convalescent Home, King Street, Port Chester, N. Y., opened in 1937 to provide convalescent care for adults. In a beautiful country setting, facilities are available for the convalescent care of 33 adults.

The Institute of Ophthalmology

Institute of Ophthalmology, 635 West 165th Street, opened in 1933, has complete facilities for the medical and surgical treatment of adult and child patients with diseases of the eye. There are private, semi-private and ward beds, with a total

capacity of 92. On January 1, 1940, the work of the Herman Knapp Memorial Eye Hospital was taken over by the Institute.

The Neurological Institute

Neurological Institute, 168th Street and Fort Washington Avenue, one of the first nongovernmental hospitals in this country for the treatment of nervous diseases, was founded in 1909. It moved from East 67th Street to the Medical Center in 1929. Its affiliation with The Presbyterian Hospital has made possible a broad basic program of teaching and research in neurology and in the treatment of diseases of the nervous system and surgical conditions of the brain and nervous system. Facilities are provided for 201 beds, of which 104 are for ward patients.

New York Orthopaedic Dispensary and Hospital

The New York Orthopaedic Dispensary and Hospital opened as a dispensary in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President of the same name. In succeeding years, the dispensary grew into a hospital with beds for ward and private patients. In 1911, the first spinal fusion operation for Potts Disease (tuberculosis of the spine) was performed by Dr. Russell A. Hibbs. This successful operation opened an entirely new era in the treatment of this disease. The Orthopaedic Dispensary and Hospital was located in its own buildings at 420 East 59th Street until December, 1950, when it moved to the Medical Center. On the 5th floor of the main building, 622 West 168th Street, facilities are available for the care and treatment of orthopedic conditions and fractures in children and adults.

The School of Nursing

The School of Nursing was founded in 1892 for the training of nurses. Since 1935, its educational program has been under the supervision of the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University. A thirty-two-month course in nursing is conducted, and graduates receive the degree of Bachelor of Science from Columbia University.

The Sloane Hospital for Women

Sloane Hospital for Women was built at West 59th Street and Amsterdam Avenue and presented to Columbia University by Mr. and Mrs. William D. Sloane in 1886. It now occupies three floors of the Presbyterian Hospital building for ward and semi-private patients and one floor in Harkness Pavilion for private patients. There are 181 beds, of which 116 are ward beds.

The J. Bentley Squier Urological Clinic

The J. Bentley Squier Urological Clinic occupies the 10th floor of the Presbyterian Hospital building and the 10th floor of Babies Hospital. There are 67 beds for the care of adults and 19 beds for children. There are laboratories fully equipped to do diagnostic, X-ray, bacteriological, pathological, fluoroscopic, and research work. This unit has two large, especially equipped, operating rooms. The urological outpatient department is in Vanderbilt Clinic.

Vanderbilt Clinic

Vanderbilt Clinic, Broadway and 167th Street, presented to Columbia University by the Vander-

bilt family in 1888, is the common outpatient department and admitting service for all the wards of all the units of The Presbyterian Hospital. It is a fully equipped dispensary offering complete medical, surgical and specialty services. Eligibility to the Clinic is determined by the admitting physician and the clinic interviewer and is limited to those unable to afford a private physician. The Group Practice Clinic, organized in 1946, has proved a forward step in the diagnosis and treatment of patients.

Other Patient Care Institutions Located at the Medical Center

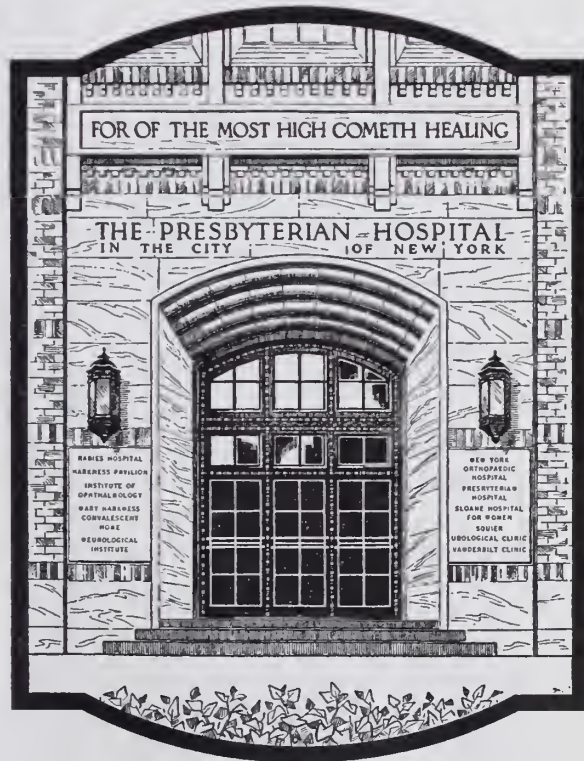
The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Francis Delafield Hospital, built and maintained by the City of New York, is a 295 bed hospital for the treatment and study of cancer.

The Washington Heights Health and Teaching Center was built and is maintained by the City of New York.

Report of the President

The Presbyterian Hospital in the City of New York



Report of the President for 1959

During 1959, much thought was devoted to the need of the Medical Center for more space in which to carry forward promising research. The Trustees of the Presbyterian Hospital and of Columbia University, after careful study, decided upon a \$50,000,000 development program. This decision now requires a major drive for capital funds and we are grateful to General Lucius D. Clay for accepting the chairmanship of the first joint appeal since the opening of the Medical Center thirty years ago.

Our searching inquiries examined both the use of present facilities and the probable demands of the future. At the same time, consideration was given to what might be done most economically by rearrangements of space, additions to existing buildings and new construction. Eventually, the appraisal made clear, as perhaps nothing else could, the changing nature, scope and, indeed, the real requirements of medical research today.

When the present buildings were occupied in 1928, they represented the first such group to be called truly a Medical Center. Some question may exist as to who first had the idea but, certainly, Columbia-Presbyterian was the first to realize the concept within a group of buildings designed specifically for the triple purpose of patient care, teaching and research.

In those days of the late 1920's, the Columbia-Presbyterian alliance afforded a considerable innovation in contemporary research opportunities. By comparison around the world, it was regarded as quite outstanding, but medical research at that time was only on the threshold of an exciting new phase. It was then the usual thing to find a doctor devoting a small part of his work to research. An assistant, some relatively inexpensive equipment and a well lighted and ventilated room seemed sufficient. I have seen photographs of the laboratories then typical of the Medical Center. The appearance, one might say the mood, was decidedly placid and the space was ample, even roomy.

Soon, however, the pace of research acceler-

ated. Judged in monetary terms it rose at the Medical Center from less than half a million dollars in 1928, to more than seven million in 1959. Judged in scientific terms, it went from simple but revealing studies in metabolism to highly complex efforts concerning cancer and heart surgery. Instead of one or two persons in each laboratory, the number jumped to a dozen or more because senior scholars and young and competent scientists were organized in teams.

A sense of urgency developed. For, again and again, this sort of concentrated research paid off in extremely important "breakthroughs" in medical knowledge, capable of saving many lives.

Recently, one part of the study of the need for capital funds set forth the major "breakthroughs" achieved at the Medical Center. By selection and condensation, this tabulation was held to about twenty-five successes, ranging from the discovery of one of the now standard antibiotics (bacitracin) and the invention of the oxygen tent, to a Nobel prize for cardiopulmonary research.

In 1928, in round figures, research used 50,000 square feet; it has come now to occupy 175,000 square feet. Thus, put in perspective, while research expenditures in money multiplied about fourteen times, manpower expanded and the necessary instruments grew larger and more complex, the actual space was only slightly more than trebled.

Consequently, laboratories, once spacious and airy for one, two or three persons, inevitably became cramped and crowded for present day research teams working at effective strength with modern tools. In at least one instance, windows had to be boarded up to gain storage for supplies. This situation, of course, cannot be prolonged, much less permitted to worsen.

Fortunately, the buildings of the Medical Center already are so arranged as to lend themselves to suitable additions. Within our twenty-five acre site, there is space available for new construction. The rearrangements, renovations and new buildings have been grouped in eight projects totaling

\$35,000,000. A ninth project seeks \$15,000,000 for endowment. Though conservatively planned, the development program promises to provide adequate space for some years to come. I will not go into details because that is done in illustrated material especially prepared for the fund drive and already widely distributed.

The raising by subscription of \$50,000,000 is a great undertaking, but it is not nearly so large as the responsibility we should bear if, instead, we permitted vital research and hospital services to be impeded, slighted or abandoned.

Out of this joint experience of review and building, we hope to achieve a closer working relationship in the full use of the resources of the Hospital and the University's College of Physicians and Surgeons. Everybody concerned has come to see our space needs as a mutual problem of the Medical Center. That is very much to the good.

You will notice such an approach in the fact that this year, for the first time, this Annual Report is a joint effort. In past years, we have issued the Hospital report on a calendar basis while the Dean of the College made his report at the end of the academic year. Much of the material affecting the professional services was necessarily duplicated. It seems clear that the Medical Center will benefit from one comprehensive report.

While we rally to the joint development program, we have to be vigilant, too, in obtaining funds for the normal needs of the Medical Center. Productive improvements in 1959 cost more than \$3,500,000. Remodeling of the Neurological Institute proceeds, for instance, by planned phases. New facilities, already evident in the rebuilt twelfth floor, broaden significantly the scope of psychiatric treatment. In 1960, the Institute will benefit from access to three elevators in a new shaft reaching all fourteen floors. Eventually, among other important results, still another modernized floor, the eighth, will become available for the rehabilitation of patients.

Within Presbyterian Hospital, the elevator systems were improved last year by replacement of six cars with a unified bank employing the latest electronic equipment. Furthermore, a recovery room for open heart surgery; an angiocardio-graph room, better to detect heart defects, and

additional machinery for rapid development of X-ray film came into service. A near doubling of the capacity of the first floor cafeteria took place; work began on a project to centralize food tray service to patients.

Surveying hospital services, we are conscious of widespread social changes in the decade just closed. These brought a tremendous upsurge of medical insurance of the Blue Cross type. At the same time insurance coverage tends to expand. The whole public expects more — and decidedly more expensive — medical attention. Striving, as indeed it does, for greater efficiency, a hospital, nonetheless, faces rising costs in which the predominant labor costs move relentlessly upward. Nor can a hospital as yet recover promptly from reimbursements such as Blue Cross the full and true costs of services performed. These circumstances, taken together, cause a serious "lag" in hospital receipts, which is worsened by a low rate of payment from the New York municipal government for the medically indigent, a rate still far below the actual costs of services rendered.

The summary below for the past year tells a story worthy of study and worthy, too, I feel, of the untiring support of our generous friends:

In 1959, the Presbyterian Hospital provided 461,000 days of hospital care for 39,100 inpatients and accommodated 421,500 clinic visits of which 110,500 clinic visits were free of charge.

Our total operating expenses were \$23,025,000 of which \$13,417,000 was paid out in salaries. After receiving \$19,896,000 from patients and others, the very large operating loss of \$3,129,000 was met by the income from endowment and by contributions.

Early in 1959, several voluntary hospitals in New York City faced demands for recognition from labor unions. There were three different unions involved and one of the unions struck seven hospitals last Spring after failing to achieve recognition at these institutions. The Presbyterian Hospital was not one of the hospitals against which the strike was directed, but our Hospital experienced a short period of picketing.

A demand for union recognition was presented to our Hospital and the Hospital's position was stated clearly to the unions and to our em-

ployees. In the best interests of all concerned, our Hospital was unwilling to recognize any union. This position is consistent with the realistic view taken by Federal and New York State lawmakers who exempted voluntary, non-profit hospitals from the provisions of the labor laws. The Hospital also stated there would be no reprisals for joining a union as long as it does not interfere with satisfactory job performance.

The Presbyterian Hospital is dedicated to the care of the sick and to the maintenance of a leading position in teaching and research. This calls for the kind of loyal employees that we have — men and women who have a sincere interest in hospital work. To attract and keep such employees, Presbyterian recognizes it must pay good wages, provide adequate benefits and set up agreeable and stable conditions of work. This has been Hospital policy, and the fact, for ninety years and will continue to be our guiding policy in the future.

With deep regret I report the deaths in 1959

of Dunlevy Milbank, a trustee for thirty-six years; Hugh J. Chisholm, a trustee for thirty years, and William Adams Delano, an honorary trustee, whose association with our work went back to 1905. Each of these men manifested a great interest in Presbyterian Hospital.

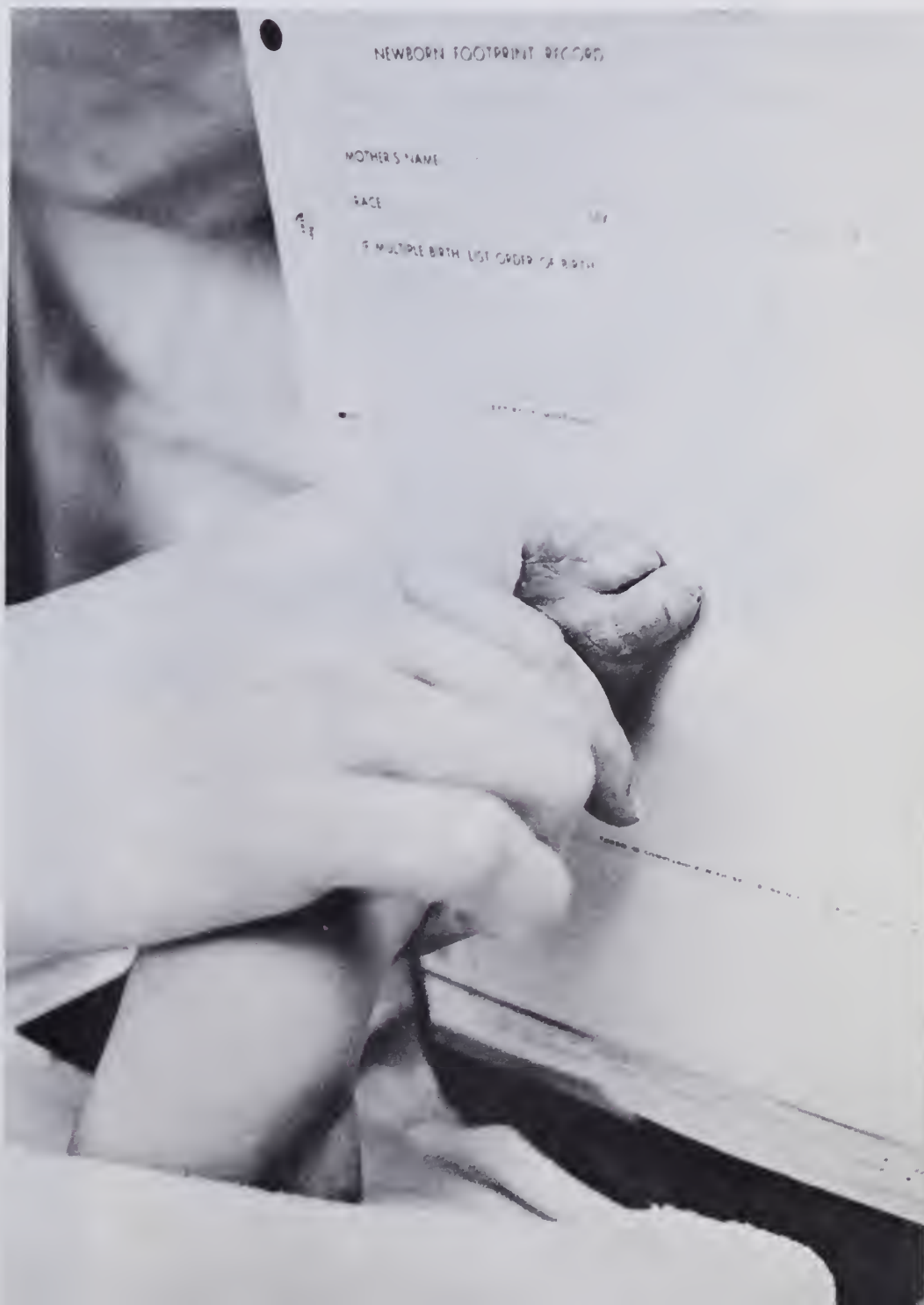
My profound thanks go to our excellent and dedicated professional staff, nurses and all our employees for their unstinted services. A special word is due the many volunteers who gave us 110,891 hours of faithful service. Special thanks are also due the members of the Auxiliaries and our profound thanks are extended to the Trustees for their able guidance and counsel. The past year was one of careful preparation for the new decade of the 1960's. With all the excellent and skilled help that we can apply to the job, certainly we should take giant strides.

CLEO F. CRAIG,
President

March 4, 1960

Dedicated to Those Who Serve,
Those Who are Served, Those Who Prepare to Serve . . .

*The newborn infant's
first footprint —
a safeguard
of identity —
is made immediately
after birth.*





Born prematurely, a baby lives in an isolette until he achieves a normal growth standard.



Sometimes disease, accident or Nature causes a deformity that is best corrected at an early age.

*Physical therapy
also plays a part in correction . . .*



*. . . and includes training in use
of various appliances and aids
for the handicapped of all ages.*

*In preparation for careers
devoted to the care of Man
and the cure of his diseases,
medical students study human cells
under the new electronmicroscope . . .*

. . . attend lectures .



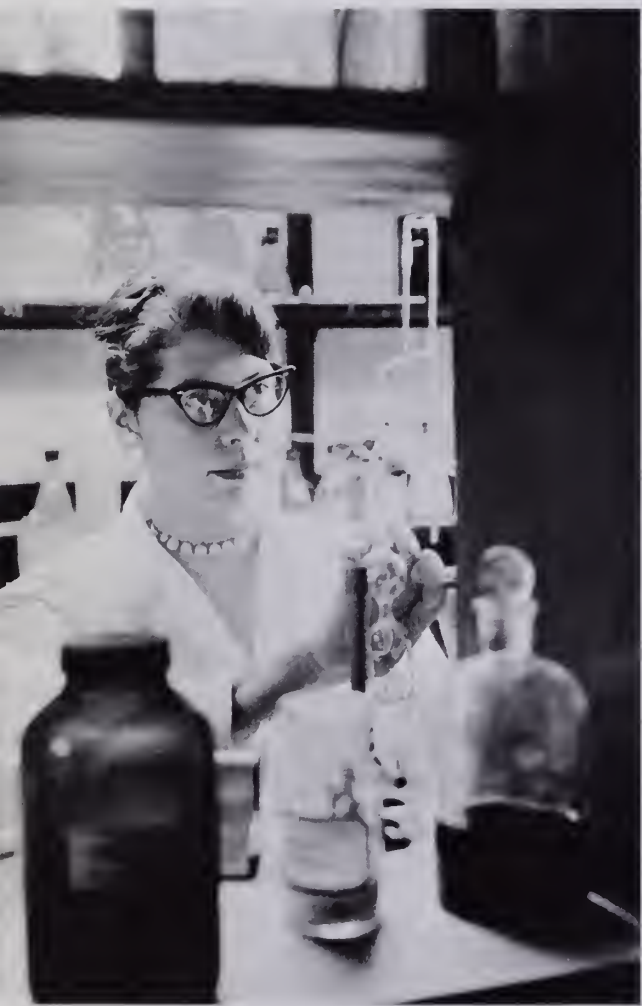




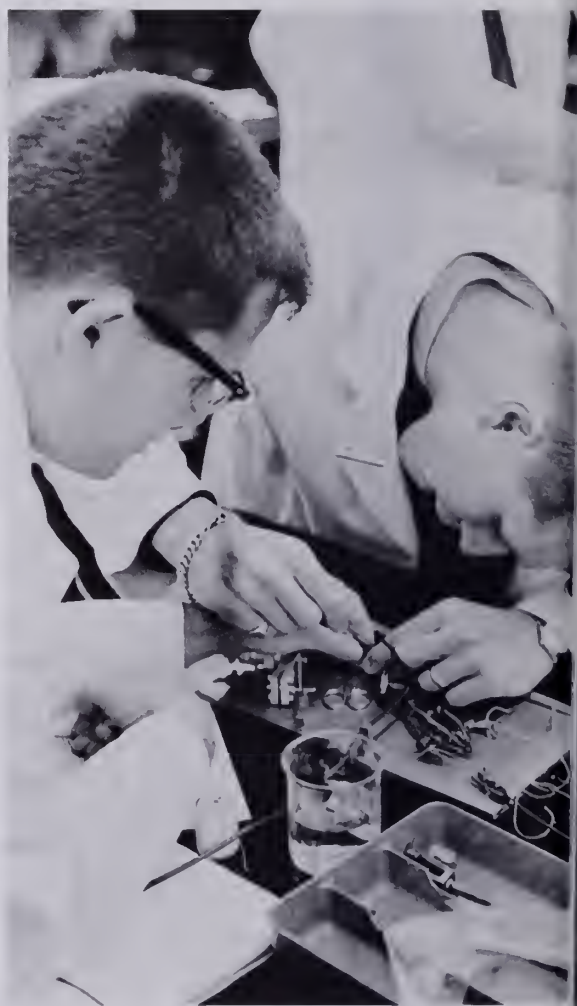
... are instructed with the aid of closed circuit television ...

*... draw on a
rich source of
books and periodicals
for reference
and study in
the Medical Library*





In laboratories, they test theories . . .



study nerve and muscle reactions.

*A round-table gathering
of graduate students
view slides in
study of neuropathology —
their field of specialization.*





With latest equipment, a second physician also can see through the microscope the area of operation inside the ear.

Radiologists can study heart function.





*Costly new equipment
is used in
cancer research.*



*The surgeon is
a well-known symbol
of the Hospital.*



*An important member
of the operating team
is the anesthetist.*



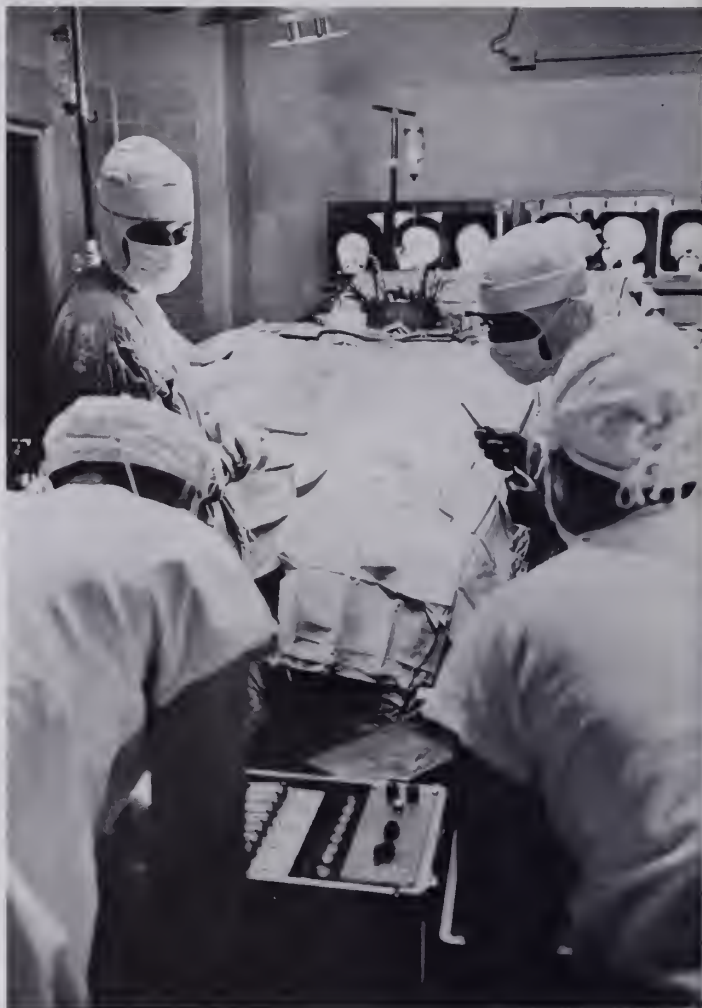
Various tests of blood or other specimens are routine procedures in the Hospital.

The daily care of the patient is the nurse's responsibility.



In one of the specialized institutions, a child may take many tests as an aid in diagnosis of his psychological problems.

*In Neurological Institute,
research has devised
a means to chart
location of brain tumor . . .*



*. . . and highly technical equipment
is used in connection
with brain surgery.*

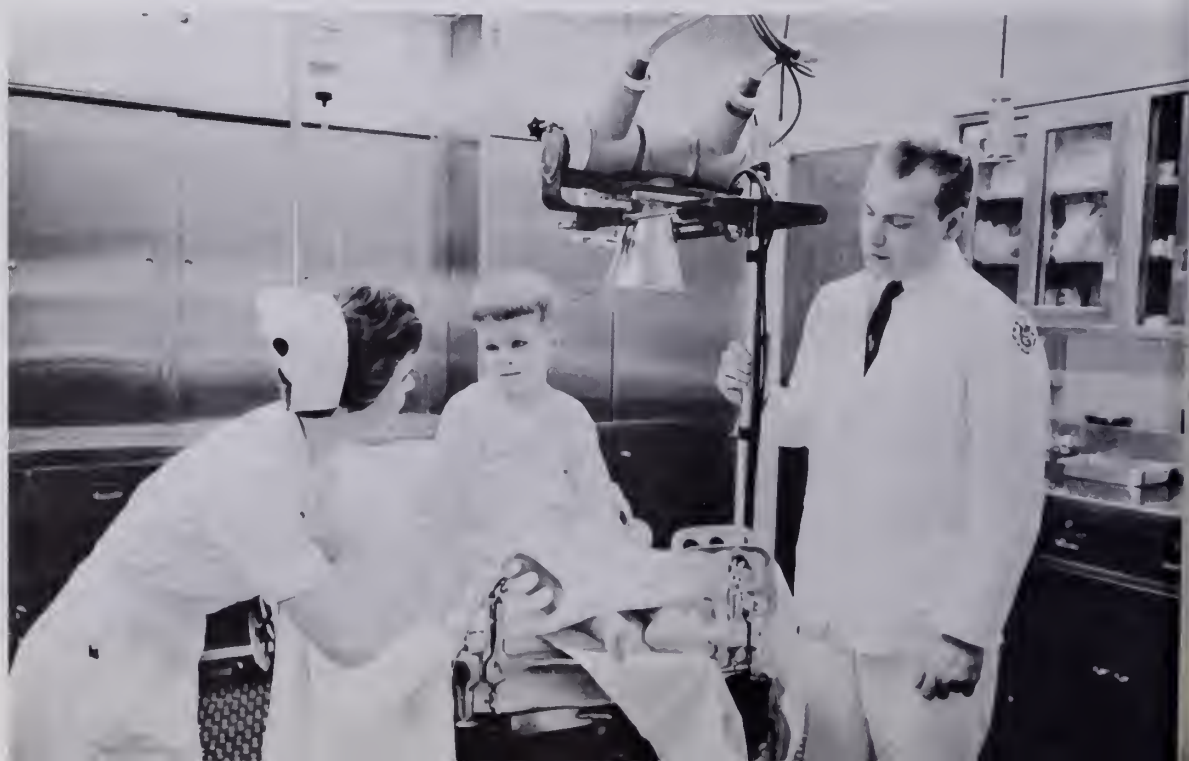
*At the Eye Institute, light with three times the power of
the sun reduced to a pinpoint, cauterizes blood vessels of a tumor.*



*Most advanced methods of
proven treatment are adopted.
The patient is placed in
tank of oxygen under pressure —
the only one of its kind
in the United States —
for treatment under the betatron.
The number of treatments
is reduced radically.*



*In every department or phase of activity in the Hospital,
the warm understanding of the nurse is important.*



Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

As the seventh decade of the century, and the fourth of the Medical Center begins, the last year of the previous decade, 1959, may be considered a turning point. During it three great figures died who had played large roles in making the Center what it is. A new Dean and a new Hospital President, working in harmony with the Joint Board and with joint committees of the Medical Board and Faculty of Medicine, undertook the difficult large scale planning for the future which must be implemented in the coming decade if the Center is to maintain its position of leadership. New chairmen of the Departments of Ophthalmology and Medicine were appointed, and faculty committees were engaged throughout the year in selecting successors to the chairs of Anatomy, Pathology and Pediatrics. Reappraisal by the Faculty of the undergraduate curriculum, which had resulted in changes in the preclinical years, was continued with the purpose of utilizing most effectively the great potential for clinical teaching of the teaching hospitals affiliated with the College of Physicians and Surgeons, especially the hospital complex at the Center which forms the corporate entity of the Presbyterian Hospital.

Deaths

On January 13, Dr. Edwin G. Zabriskie died in Harkness Pavilion in his 85th year. A great neurologist, Dr. Zabriskie had been a member of the Neurological Institute staff since 1910 and was its Chief of Staff at the time of the consolidation of the Institute with the Medical Center in 1928. In 1946 and 1947, he served as its acting Director. As much loved for his wit and wisdom as he was honored for his professional accomplishments, his death has deprived the Medical Center of a great leader, the profession of a wise physician, and his colleagues of a warm and steadfast friend.

On April 18, death came suddenly to Dr. David C. Bull. A faithful and valued member of the surgical staff since 1920, Dr. Bull was chief of clinic in surgery at the time of the hospital's move

to the Center until 1933. A tireless worker, skillful surgeon and fine teacher, he is greatly missed by his colleagues.

On July 24, 1959, Dr. George F. Cahill died in Harkness Pavilion in his 69th year. Trained in general surgery, Dr. Cahill was a pioneer in the development of urological surgery as a specialty. A member of the staff of Presbyterian Hospital since 1919, he became a principal member of the staff of the Squier Clinic ten years later when this became the specialty service of the Medical Center, and in 1939 he was appointed Director. During the transitional period following World War II, from 1946 to 1948, he served as President of the Medical Board. A holder of many important offices and receiver of many awards, Dr. Cahill will be remembered by his colleagues primarily as skillful surgeon and a warm friend whose loss to his specialty is shared by his whole profession.

On November 22, 1959, Dr. Albert R. Lamb died at home after a long illness. With Dean William Darrach, Mr. Edward Harkness and Mr. Dean Sage he was a founder of the Medical Center as it now is. To his wisdom, vision and tact during the planning of the Center, the effective realization of this pioneering innovation in medical education is in large part due. A vital member of the Medical Board for thirty years, he served as its President from 1940 to 1946. His history of the hospital is a monument to his own work, but he has left us far more than this in the noble tradition of the highest ideals in medical education and patient care for which we will forever be in his debt.

Staff Changes

The many staff retirements, resignations and new appointments which constitute the normal metabolism of a vigorous organism are noted in the reports of each department. Noteworthy among them, however, are the retirements of two of our most distinguished Directors, and their replacement by worthy successors.

On July 1, 1959, Dr. Robert F. Loeb began his

terminal sabbatical leave as Director of the Medical Service. The thirty-eight eventful years of his service to the medical school and to the hospital saw the firm establishment of the scientific method as a basis for medical treatment of which he was an outstanding exponent. As department chairman and director of the Medical Service in the hospital since 1947, Dr. Loeb has left an enduring tradition in the many able young men he attracted who will carry on the work of the Department.

Notable among these men is Dr. Stanley E. Bradley who became Director of the Medical Service on July 1. Internationally distinguished for his research on the circulation of the kidneys and liver, he is equally well known here for his deep interest in student teaching and resident training. The Faculty and professional staff of the hospital take pride and satisfaction in the confidence that the direction of this key department is in such able hands.

On July 1, Dr. John H. Dunnington retired as Director of the Institute of Ophthalmology, a post which he held since 1942. As an Associate in Ophthalmology since 1929 at the College of Physicians and Surgeons and as an Attending Ophthalmologist at Presbyterian Hospital, he was known for his work in wound healing of the eye. The author of numerous scientific papers, Dr. Dunnington was elected president of the American Ophthalmological Society in 1950 and has served as chairman of various other professional groups. In 1955, he gave the Bowman Lecture in England, one of two Americans ever to have this honor.

To succeed Dr. Dunnington, Dr. Arthur G. DeVoe was appointed Director of the Service of Ophthalmology and Chairman of the Department in the College of Physicians and Surgeons on July 1. Trained at the Medical Center, where he was a staff member for ten years, Dr. DeVoe left in 1950 to become Chairman of the Department of Ophthalmology at the New York University Postgraduate Medical School. A skillful specialist with broad interests in teaching and research, the Center welcomes him back as an old and valued friend.

Structural Changes

At its meeting on June 16, the Joint Committee

on Facilities reported to the Medical Board their recommendation for extensive expansion of the Medical Center. This program has, since that time, been accepted by the Trustees of both University and Hospital who have organized and are about to start a vigorous appeal for the large sum which will be needed. The Medical Board and every member of the professional staff gratefully welcome this major step forward and will give it enthusiastic support. To this end Dr. Frank E. Stinchfield has accepted the chairmanship of the professional subcommittee of the overall committee for fund raising, chaired by General Lucius D. Clay.

While these major additions to the Center were being planned, reconstruction of existing facilities went forward actively in many areas. Renovation of the elevators in the main building has been nearly completed and service is already substantially improved. The cafeteria has been enlarged and is functioning well. Revision of the original eight operating rooms on the 18th floor is finished, and it is planned to continue to use the suite on the 3rd floor which was revised during the reconstruction period, for major inpatient operations. The special recovery room for cardiac surgery patients has been equipped and staffed and is serving its purpose admirably.

Extensive renovation of the Neurological Institute, begun the year previous, is proceeding satisfactorily. A first step in the sorely needed improvement in parking facilities was taken when the south property lot was enlarged by removal of obsolete buildings and both lots were paved. Ultimately, the need to double deck the south lot seems inevitable to the Board and its Parking Committee, which recommended the institution of parking charges in the expectation that this would support such an improvement.

Committee Activities

In addition to the Parking, the Planning, and the Joint Committee on Facilities whose actions are concerned with structure, another dozen committees have worked hard to formulate policies for improving patient care and to bring their recommendations to the Medical Board. Noteworthy among these are: the recommendations of the Residency Program Committee to increase the numbers of the resident staff where need was

lear; the recommendation of the Record Committee to preserve records beyond twenty-five years; the recommendations of the Blood Bank Committee to improve safety and increase blood procurement; the fine reports of subcommittees of the Staff Committee, especially that dealing with "home-care" programs; the report of the Social Service Committee outlining the success of measures taken to improve this vital aspect of care.

A new ad hoc committee, under the chairmanship of Dr. Hamilton Southworth was appointed to consider factors in utilization of hospital beds. Included in this study are causes in delay of urgent admissions, possible prolongation of hos-

pital stay due to delays in diagnostic or therapeutic measures, and the possibility of shortening stays through expanded home-care services.

Through these and the many other committees' activities the Medical Board continues ever mindful of its responsibility to the Trustees for that excellence of care which must be maintained if the hospital is to carry out its purpose of teaching its students and residents by example, and serving the community which gives it such generous support. For that continued support the Board is deeply grateful and, with it, is confident in the promise of the future.

GEORGE H. HUMPHREYS, II, M.D.,
President of the Medical Board

Report of the Treasurer

The Presbyterian Hospital in the City of New York

EXHIBIT A

THE PRESBYTERIAN HOSP

Balance

DECEMBER

ASSETS

	<i>December 31</i>	
	<u>1959</u>	<u>1958</u>
ENDOWMENT FUNDS ASSETS:		
Investments:		
Bonds and stocks — at cost or contributed value (market value		
— 1959, \$81,873,193)	\$61,593,651	\$60,718,057
Mortgages receivable, etc.	93,319	97,306
Cash	560,688	1,906
TOTAL ENDOWMENT FUNDS ASSETS	<u>\$62,247,658</u>	<u>\$60,817,269</u>
PLANT ASSETS:		
Property and equipment at cost (less accumulated depreciation —		
1959, \$12,984,707; 1958, \$13,838,100)	\$22,985,373	\$20,850,242
Replacement funds — Bonds and stocks — at cost (market value —		
1959, \$5,601,013)	4,209,425	5,179,566
TOTAL PLANT ASSETS	<u>\$27,194,798</u>	<u>\$26,029,808</u>
CURRENT FUNDS ASSETS:		
Investments — Bonds, etc. — at cost (market value — 1959,		
\$1,101,666)	\$ 1,111,566	\$ 1,700,645
Cash	518,368	545,091
Accounts receivable (less reserve — 1959, \$211,642; 1958,		
\$266,088)	2,760,758	2,345,129
Supplies and materials	446,706	386,015
Interest accrued and dividends receivable	548,541	530,724
Prepaid insurance, etc.	46,636	88,555
TOTAL CURRENT FUNDS ASSETS	<u>\$ 5,432,575</u>	<u>\$ 5,596,159</u>
TOTAL	<u><u>\$94,875,031</u></u>	<u><u>\$92,443,236</u></u>

EXHIBIT A

THE CITY OF NEW YORK

Sheet

1957 AND 1958

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<u>1959</u>	<u>1958</u>
ENDOWMENT FUNDS (Exhibits C and D)	\$62,247,658	\$60,817,269
PLANT FUNDS (Exhibit C):		
Capital invested in property and equipment	\$22,985,373	\$20,850,242
Replacement funds	4,209,425	5,179,566
TOTAL PLANT FUNDS	<u>\$27,194,798</u>	<u>\$26,029,808</u>
CURRENT FUNDS AND LIABILITIES:		
General fund (Exhibit C)	\$ 2,495,819	\$ 3,027,940
Special expendable funds (Exhibit C)	1,732,947	1,457,789
Undistributed income from investments	141,018	
Accounts payable	559,381	473,754
Patients' credit balances	55,757	69,612
Accrued payroll and other expenses	447,653	567,064
TOTAL CURRENT FUNDS AND LIABILITIES	<u>\$ 5,432,575</u>	<u>\$ 5,596,159</u>
TOTAL	<u>\$94,875,031</u>	<u>\$92,443,236</u>

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INCOME

For the Years Ended December 31, 1959 and 1958

	<i>Year Ended December 31</i>	
	<i>1959</i>	<i>1958</i>
OPERATING INCOME:		
Care of patients.....	\$17,082,688	\$15,586,951
Other services	1,761,303	1,641,159
TOTAL	<u>\$18,843,991</u>	<u>\$17,228,110</u>
Transfer from special expendable funds (Exhibit C):		
For research	468,305	457,027
For other designated purposes.....	583,663	493,827
TOTAL OPERATING INCOME.....	<u>\$19,895,959</u>	<u>\$18,178,964</u>
OPERATING EXPENSES:		
Administration	\$ 247,650	\$ 229,731
Assistant Secretary-Treasurer	167,714	159,575
Comptroller	416,035	373,908
Public Interest	160,007	127,555
Convalescent Home	186,076	203,763
Non-professional services:		
Buildings and Grounds.....	2,941,864	2,678,689
Food Service	2,636,053	2,516,810
Personnel and Protective.....	319,288	258,061
Other non-professional services.....	731,715	680,444
Professional services:		
Nursing	6,080,485	5,602,585
Professional Staff, Doctors' Offices & Research.....	2,713,310	2,613,271
Special Services	3,371,560	3,047,750
Vanderbilt Clinic and other.....	1,660,454	1,550,298
Provision for depreciation.....	1,392,600	1,304,900
TOTAL OPERATING EXPENSES.....	<u>\$23,024,811</u>	<u>\$21,347,340</u>
NET OPERATING LOSS.....	<u>\$ 3,128,852</u>	<u>\$ 3,168,376</u>
OTHER INCOME FOR GENERAL PURPOSES:		
Investment income	\$ 2,520,000	\$ 2,550,000
Contributions	649,424	607,698
TOTAL OTHER INCOME FOR GENERAL PURPOSES.....	<u>\$ 3,169,424</u>	<u>\$ 3,157,698</u>
NET INCOME (LOSS) (transferred to general fund — Exhibit C)	<u>\$ 40,572</u>	<u>\$ (10,678)</u>

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1959 and 1958

	<i>Year Ended December 31</i>	
	<u>1959</u>	<u>1958</u>
ENDOWMENT FUNDS		
Balance, January 1.....	\$60,817,269	\$60,361,221
Add:		
Legacies and contributions.....	\$ 191,897	\$ 338,673
Gain (loss) from investments sold or redeemed.....	1,135,992	(69,761)
Transfers from special expendable funds.....	102,500	187,136
	<u>\$ 1,430,389</u>	<u>\$ 456,048</u>
Balance, December 31.....	<u>\$62,247,658</u>	<u>\$60,817,269</u>
PLANT FUNDS		
Capital Invested in Property and Equipment:		
Balance, January 1.....	\$20,850,242	\$20,542,997
Add:		
Transfers from:		
General fund	\$ 832,711	\$ 399,991
Special expendable funds.....	75,927	374,282
	<u>\$ 908,638</u>	<u>\$ 774,273</u>
Total	\$21,758,880	\$21,317,270
Deduct — Net change in accumulated depreciation (provision, less replacements and rearrangements)	(1,226,493)	467,028
Balance, December 31.....	<u>\$22,985,373</u>	<u>\$20,850,242</u>
Replacement Funds:		
Balance, January 1.....	\$ 5,179,566	\$ 4,124,655
Add:		
Appropriation for depreciation.....	\$ 1,392,600	\$ 1,304,900
Investment income	256,352	237,883
	<u>\$ 1,648,952</u>	<u>\$ 1,542,783</u>
Total	\$ 6,828,518	\$ 5,667,438
Deduct — Replacements and rearrangements.....	2,619,093	487,872
Balance, December 31.....	<u>\$ 4,209,425</u>	<u>\$ 5,179,566</u>

EXHIBIT C — *Continued*

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1959 and 1958

	<i>Year Ended December 31</i>	
	<u>1959</u>	<u>1958</u>
GENERAL FUND		
Balance, January 1.....	\$ 3,027,940	\$ 2,942,078
Add:		
Unrestricted legacies	\$ 259,672	\$ 491,972
Gain from investments sold or redeemed.....	346	4,559
Net income (loss) (Exhibit B).....	40,572	(10,678)
	<u>\$ 300,590</u>	<u>\$ 485,853</u>
Total	\$ 3,328,530	\$ 3,427,931
Deduct:		
Expenditures for property and equipment.....	832,711	399,991
Balance, December 31.....	<u>\$ 2,495,819</u>	<u>\$ 3,027,940</u>
SPECIAL EXPENDABLE FUNDS		
Balance, January 1.....	\$ 1,457,789	\$ 1,661,181
Add:		
Legacies and contributions.....	\$ 1,017,026	\$ 803,003
Investment and other income.....	647,601	629,562
	<u>\$ 1,664,627</u>	<u>\$ 1,432,565</u>
Total	\$ 3,122,416	\$ 3,093,746
Deduct:		
Transfers to:		
Operating income (Exhibit B).....	\$ 1,051,968	\$ 950,854
Endowment funds	102,500	187,136
Expenditures for property and equipment.....	75,927	374,282
Miscellaneous	159,074	123,685
	<u>\$ 1,389,469</u>	<u>\$ 1,635,957</u>
Balance, December 31.....	<u>\$ 1,732,947</u>	<u>\$ 1,457,789</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

ENDOWMENT FUNDS

December 31, 1959

THE PRESBYTERIAN HOSPITAL:

Anonymous	\$ 671,289	Harkness, The Mary S., for Convalescent Care	1,003,045
Anonymous — For Support of Residency Training	270,500	Harkness, William Hale, Memorial...	43,416
Arnstein, Daniel G.....	80,000	Hartford, The John A., Foundation...	300,000
Baker, Frances E.....	11,058	Hill, Marguerite S.....	5,500
Baker, Mrs. Frederick, Pathological Department	8,500	Institute of Ophthalmology, The.....	3,412,942
Briddon, C. K., Gold Medal.....	2,559	Jesup, Morris K. and Maria DeWitt...	100,000
Brookman, Henry D.....	50,000	Jones, David, Memorial.....	300,000
Cary, Caroline Catherine.....	50,000	Jones, Margarette A.....	166,255
Coakley, Cornelius G.....	665,445	Keller Memorial	500
Coakley, Cornelius G., Memorial....	30,000	Kennedy, John Stewart.....	1,828,714
Colgate, Hannah, Memorial.....	60,794	Kinnicutt, The G. Herman, Flower...	5,000
Collins, Perry McDonough.....	548,999	Knapp, The Herman, Memorial Eye Hospital Endowed Bed.....	60,375
Columbia University for Vanderbilt Clinic and Sloane Hospital.....	1,400,000	Krumb, Henry	25,000
Cook, William W.....	114,849	Lattimer, Dr. John K.....	61,411
Cragin Fund	68,819	Lindley, Erasmus C.....	50,000
Davis, Isabel G.....	813,999	MacMillin, Isabel, Memorial.....	1,409,359
Delano, Moreau	4,000	Maloy, The Frank and Selena, Memorial	25,000
Department of Surgery Research....	28,371	Martin, Frederick Townsend.....	10,000
Dodge, The Cleveland H.....	310,500	Maxwell, Anna C., Memorial Library	7,301
Dortic Memorial	99,024	McCosh, Dr. Andrew J., Memorial...	100,192
Dows, Mrs. David.....	7,700	McCreedy, Jeanne Campbell.....	106,529
Dows, Margaret E.....	5,360	McGuire, Mary Madison.....	260,006
Educational and Scientific Work....	285,528	Medical Center Development Program	4,105
Eichner, Joseph Herman and Hannah, in Memory of.....	8,576	Medical Laboratory Development Endowment	120,000
Eidlitz, Otto M.....	415,272	Medical Scientific	317,226
Eidlitz, Robert J.....	152,500	Miller, Margaret G.....	60,275
Endowed Bed	1,866,800	Moore, Paul, Research.....	85,000
Endowed Bed — Research	190,003	Nathan, Garfield Arthur.....	258,981
Faulkner, The Edward Daniels, Memorial for the Study and Treatment of Arthritis	100,000	O'Connor, Fenwick	7,020
Fiske Fund	104,236	Ottman, for Cancer Research.....	20,000
FitzGerald, Frederick H. and Josephine F.	141,363	Parkin, Alice Temple.....	50,000
Flagler, Alice Manderlick.....	250,142	Physical Medicine and Rehabilitation Service Endowment	100
Foote, Edwin Bancroft.....	175,949	Prostate, Fund for Research.....	1,781
Ford, George W. and Eliza Lawson...	330,911	Quick, The Walter R.....	15,060
Fracture Endowment Fund.....	10,000	Research and Development in Anesthesiology	66,000
General Endowment	264,481	Research and Development in Department of Medicine.....	19,500
Goldschmidt, Henry Philip	5,000	Rogers, Henry H., Memorial.....	30,294
Gondran, Sophie M. and Adolph L....	100,000	Sage, Dean, Memorial.....	28,253
Griffith, Griffith W. and Mary Jones, Memorial	1,331,292	Sage, Dean, Scholarship.....	7,000
Haller, Maria L.....	2,609	Sage, Russell and Margaret Olivia, Memorial	878,188
Harkness, Edward S.....	6,188,794	School of Nursing.....	203,230
Harkness, Edward S., Memorial.....	14,000,000	Sherry, The Bertha, Memorial.....	653,401
Harkness, Edward S., Research.....	500,000	Sidman Trust	1,072
Harkness, Mary Stillman, Memorial Endowment	250,000	Sloane Hospital	783,257
Harkness, Mary Stillman, Memorial Research	50,000	Sloane Hospital Babies' Alumni.....	19,597
		Sloane Hospital Research.....	25,000
		Squier Clinic	113,636
		Stein, Jules	25,000

ENDOWMENT FUNDS — *Continued*

Stilson, Ellen J. and Minnie.....	21,029	McIntosh, Dr. Rustin.....	16,921
Stone, William Ridgley, Memorial....	81,033	Rathbone, R. Bleecker	15,000
Surgical Fellowship	60,000	Rumson Fund.....	20,470
Terry, John T., in Memory of.....	40,767	Videre, Leontine, Foundation.....	9,976
Tod, J. Kennedy, Memorial.....	100,102	Wilcox, Herbert B., Memorial.....	2,000
Tolfree, The Caroline O. and James E., Memorial	157,370		<u>\$ 2,261,043</u>
Urological Service Research.....	9,641	NEUROLOGICAL INSTITUTE:	
Valentine, Isaac E., Memorial.....	563,227	Blair Memorial	\$ 3,127
Van Norden, Kathryn L.....	2,609	Endowed Bed — Research	166,049
Vanderbilt Clinic	156,806	Ogilvie, Clinton, Memorial.....	9,970
Webster, Dr. Jerome P., Library of Plastic Surgery	30,861		<u>\$ 179,146</u>
Weinman, Moses.....	5,360	NEW YORK ORTHOPEDIC HOSPITAL:	
Weisl, Alice	130,125	Bridgman, Statira	\$ 2,500
Welles, Frances Swan	10,000	Endowed Bed	623,343
Westlake, Emory H. and Caroline B... Wheeler, The Dr. John M., Memorial..	27,092 73,791	Farrell, Dr. Benjamin P., in Memory of General Endowment	7,656 833,259
Williams, William	342,658	Hibbs, Russell A., Memorial Library..	36,068
	<u>\$46,911,214</u>	Hurst, The Thomas D. and Kate.....	5,000
THE BABIES HOSPITAL:		Kane, Annie C., Fellowship.....	1,000,000
Cleft Palate Cases	\$ 8,333	Orthopedic Surgery Endowment.....	30,000
Cribside Social Service Committee....	12,828	Rathbone, R. Bleecker	15,000
Educational Therapy	1,000	Smith, Dr. Alan DeForest, Lectureship	6,601
Eichner, Joseph Herman and Hannah, in Memory of.....	8,576	Tower, Mary T., in Memory of.....	30,569
Endowed Bed	37,426	Watson, Emily A.....	2,502,256
General Endowment	10,000	White, Emily Vanderbilt.....	20,000
Harkness, Edward S., Educational and Scientific	600,000	Willard, Mary Livingston.....	5,000
Harkness, Edward S.....	1,199,775		<u>\$ 5,117,252</u>
Harkness, Mary Stillman, Memorial Endowment.....	250,000	Gain from Endowment Fund Investments Sold or Redeemed since November 1, 1946.....	7,779,003
Kimball, Reuel B.....	57,738		
Lambert, Dr. Charles I., Memorial....	11,000	Total Endowment Funds.....	<u>\$62,247,658</u>

ACCOUNTANTS' OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the balance sheet and supporting schedule of endowment funds of The Presbyterian Hospital in the City of New York as of December 31, 1959 and the related statement of income and summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In 1959 the Hospital discontinued the practice of charging operating expenses to provide for a portion of the depreciation which occurred prior to the adoption of depreciation accounting in 1953 and concurrently revised the estimated useful lives of depreciable assets. The net effect of these two changes on income in 1959 was not material.

In our opinion, the accompanying balance sheet and schedule of endowment funds and the statement of income and summary of fund changes present fairly the financial position of the Hospital at December 31, 1959 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied (except for the changes explained in the preceding paragraph) on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

New York
February 1, 1960.

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the books and accounts of The Presbyterian Hospital in the City of New York for the fiscal year 1959.

We submit herewith, after due consideration by this Committee, an opinion of Messrs. Haskins & Sells dated February 1, 1960 relating to the Corporation's balance sheet and schedule of endowment funds as of December 31, 1959 and related statement of income and summary of fund changes for the year then ended, as the results of a satisfactory examination of the said books and accounts. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*
JOHN S. BURKE, JR.
DORRANCE SEXTON
Auditing Committee

New York
February 4, 1960.

EXHIBIT E

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly insured by the Travelers Insurance Company. The amounts set aside for retirement benefit purposes, which are not part of the assets of the Hospital, aggregated \$5,640,429 at December 31, 1959. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1959 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1959 of the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1959.....	\$2,013,875
Payments to Fund.....	144,000
Net Income from Investments including Net Profit on Investments Disposed of.....	94,859
	<u>\$2,252,734</u>
Disbursements for Retirement Benefits.....	77,160
Assets in Fund — December 31, 1959.....	<u>\$2,175,574</u>

	<i>Book Value*</i>
Consisting of:	
U. S. Government Obligations.....	\$ 116,595
Industrial, Railroad, Public Utilities and Miscellaneous Bonds.....	1,240,923
Preferred Stocks	76,570
Common Stocks	739,071
Cash	2,415
	<u>\$2,175,574</u>

* The cash and approximate market value of the securities held as of December 31, 1959 totaled \$2,471,063.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

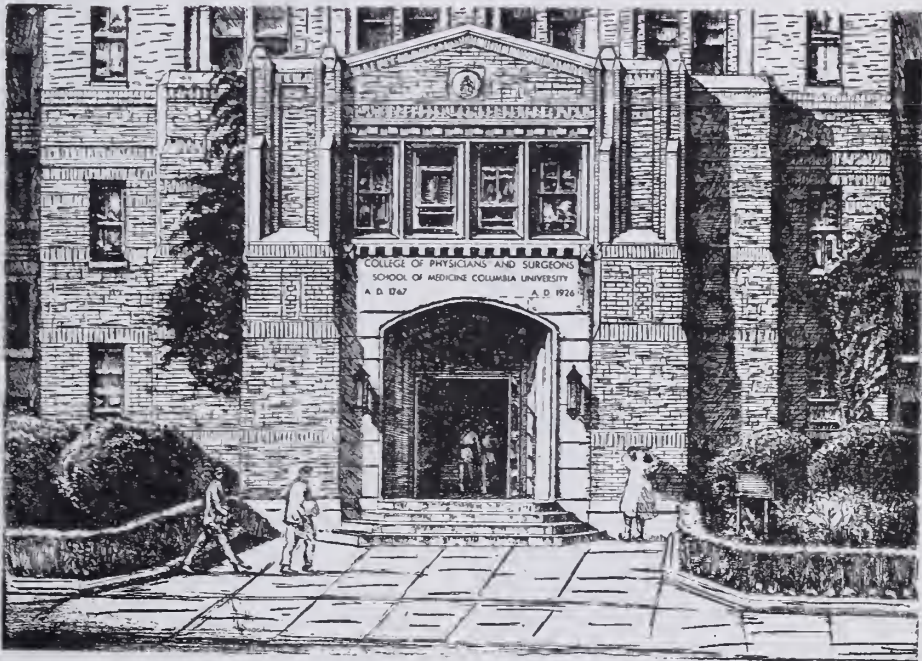
By WILLIAM F. LACKMAN,
Vice President

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1959:

Retirement Fund Trust — Morgan Guaranty Trust Company of New York, Trustee	\$2,175,574
Travelers Insurance Company Reserve for Annuities Purchased.....	3,464,855
TOTAL	<u>\$5,640,429</u>

Report of the Dean of the Faculty of Medicine

College of Physicians and Surgeons
Columbia University in the City of New York



Report of the Dean of the Faculty of Medicine

For the first time, the report of the Dean of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University is combined with the annual report of The Presbyterian Hospital in the City of New York. This is another step toward the achievement of the goal of making the Columbia-Presbyterian Medical Center a functioning cohesive unit. It is realized, however, that the Dean's report will include a record of the activities of the clinical services in the other hospitals affiliated with our School. In order to adapt our report to the calendar year, the statistics given cover the period from July 1, 1958 to December 31, 1959. This plan has also been followed by the Chairmen of the various departments.

This is the first report submitted by the present Dean who succeeded Dr. Willard C. Rappleye upon his retirement June 30, 1958. Dr. Rappleye became the Dean in 1931, and served in this capacity for twenty-seven years. Under his guidance the educational program forged steadily forward and, in addition, there was a phenomenal growth in the research activities of the School. In his report for the academic year ending June 30, 1957, he noted that grants-in-aid for research had increased from approximately \$200,000 in 1934-35, to about \$4,300,000 for that year. During the past year and a half, these activities have continued to expand at an ever increasing rate and the total of our grants-in-aid from the Government, foundations, lay health organizations and philanthropic individuals now is over \$7,000,000 on an annual basis. This great increase has brought to our School a large number of scientists of a high caliber. This in turn has reflected itself in improvement in the education of our students. In addition, many training programs sponsored by the National Institutes of Health have been instituted in the various basic sciences and clinical departments. This has enabled us to train a large number of young physicians in the basic sciences and to increase the number of candidates who are working for the Ph.D. and other degrees.

The expansion of the research activities has re-

sulted in a crowding of our facilities to such a point that, at the present time, we are totally unable to take on any additional projects. In order to realize our potentials it has become obvious that expansion is necessary. Plans which were initiated by Dean Rappleye have been vigorously pursued in the past year and we are happy to announce that the Trustees of the University and the Trustees of the Hospital have approved a development program at the Medical Center which will include: construction of a building for research; a new auditorium; expansion of the library; additions to Bard Hall for the housing of married students, residents and fellows; the remodeling of the class rooms and laboratories in the School; and a number of essential improvements in the clinical and service facilities in the Hospital.

A joint campaign for the raising of funds in the name of the Columbia-Presbyterian Medical Center, Inc. has been started with General Lucius Clay as Director of the campaign. The results to date have been so good that success seems to be assured and architectural plans for the research building, the library and the auditorium, as well as some of the facilities in the Hospital are now being drawn. The research building will be eighteen stories high and will provide 137,000 square feet of space for new laboratories. This will meet our immediate needs but will allow for only a modest extension of our present activities. This makes it necessary for us to stop and consider how extensive a research program we should undertake. The general consensus is that investigation is essential not only for acquisition of knowledge but also for the improvement of the caliber of our instruction. It is agreed, however, that the extent of our research activities should be tailored to conform with the size of our educational program.

The curriculum of the Medical School is under constant study and attempts to improve the methods of teaching are being tried. No radical changes have been made but the schedule of the first two

years has been arranged so that the programs of instruction in the various basic sciences are coordinated with each other and with the clinical sciences in order that the student may obtain a longitudinal rather than a horizontal picture of medicine.

On July 1, 1959, the School of Dental and Oral Surgery was made an independent school in the University with Dr. Gilbert P. Smith as Dean. Dr. Smith has under preparation plans for the improvement and expansion of his School.

The Medical Center suffered a great loss in the deaths of George F. Cahill, Professor Emeritus of Urology and formerly Chairman of the Department of Urology; Edwin G. Zabriskie, Professor Emeritus of Clinical Neurology and Acting Director of the Neurological Institute from 1946-48; Albert R. Lamb, Professor Emeritus of Clinical Medicine, who was very active in the formation of the Medical Center.

On June 30, 1959 Dr. John H. Dunnington, Professor of Ophthalmology and Chairman of the Department of Ophthalmology, retired and was succeeded by Dr. A. Gerard DeVoe. Dr. DeVoe was trained in Ophthalmology at the Institute of Ophthalmology under Dr. Dunnington. He has been Professor and Chairman of the Department of Ophthalmology at New York University Postgraduate Medical School since 1950.

The registration of the School of Medicine was as follows:

	1958-59	1959-60
First Year	120	120
Second Year	121	119
Third Year	117	118
Fourth Year	118	117
Total	476	474

Residents from forty-eight states, the District of Columbia, and thirty-one foreign countries, totaling 1,254 students from 256 colleges, applied for admission to the first year class entering in September, 1959. The 120 accepted students received their liberal arts education in fifty-two different colleges and came from twenty-seven states and five foreign countries.

Although there is a reported national trend in admissions to medical school which indicates that applicants are fewer and less well-qualified, the College of Physicians and Surgeons has not experienced any falling off, either in numbers or

the high quality of liberal arts students seeking admission.

The registration of the School of Dental and Oral Surgery was as follows:

	1958-59	1959-60
First Year	40	40
Second Year	39	41
Third Year	39	38
Fourth Year	32	38
Total	150	157

In September, 1958, there were thirty-five students registered for non-credit postgraduate courses in the Dental School and sixty-one students registered for postgraduate credit courses. In September, 1959, there were forty-one students registered for non-credit postgraduate courses in the Dental School and sixty-six students registered for postgraduate credit courses. A class of twenty-seven students was enrolled in September, 1958, for the Courses for Dental Hygienists; twenty-nine students were enrolled in September, 1959. Ten received the Bachelor of Science degree in 1959.

In the School of Public Health and Administrative Medicine the registration was as follows:

	1958-59	1959-60
D.P.H. candidates	2	2
M.P.H. candidates	35	47
M.S. candidates	75	97

The registration in the Department of Nursing was as follows:

	1958-59	1959-60
First Year	129	127
Second Year	127	112
Third Year	116	122
Total	372	361

In the Course for Occupational Therapists, twenty-seven students were registered in September, 1958, and twenty-five in September, 1959. In the Course for Physical Therapists, forty-four students were registered in September, 1958, and thirty-eight in September, 1959.

The following degrees were awarded:

M.D.	117
Med. Sc. D.	2
D.D.S.	32
D.P.H.	2
M.P.H.	34
M.S. (Nursing and Public Health fields)	42
B.S. (Nursing, Occupational Therapy, Physical Therapy, Dental Hygiene)	140

In addition to the students enrolled under the Faculty of Medicine, there were approximately forty-five students registered under the Graduate Faculties of the University who took courses and advanced research work in the departments of the Medical School.

The preceding figures indicate that the Faculty of Medicine is responsible for the instruction of many more students, graduate and undergraduate, than is commonly known. The total of medical, graduate, postgraduate, nursing, occupational therapy, physical therapy, dental, dental hygiene, and public health students, visiting scholars, fellows, hospital residents and younger staff members runs to over three thousand full-time and part-time students.

It is gratifying to report that during the academic year 1958-59, 165 medical students received scholarships averaging \$500 to \$600. Of these, twenty-one were summer research scholarships. From July 1, 1959 to December 31, 1959, 138 tuition scholarships and fifty-two summer research scholarships were awarded.

It is with the greatest sorrow that we report the following deaths:

Francis C. Ansanelli, Associate in Neurology and Associate Attending Neurologist, Presbyterian Hospital, on December 16, 1958

Richard M. Brickner, Assistant Clinical Professor of Neurology, on April 25, 1959

David C. Bull, Assistant Professor of Clinical Surgery and Associate Attending Surgeon, Presbyterian Hospital, retired, on April 18, 1959

George F. Cahill, Professor Emeritus of Urology and Consultant, Presbyterian Hospital, on July 24, 1959

Marcel Goldenberg, Assistant Clinical Professor of Medicine and Assistant Attending Physician, Presbyterian Hospital, on July 30, 1958

Aaron Himmelstein, Associate Professor of Surgery, Associate Attending Surgeon, Presbyterian Hospital, and Visiting Surgeon, First Surgical Division, Bellevue Hospital, on December 18, 1959

Nicholas Kopeloff, Assistant Professor of Microbiology (assigned to Psychiatry), retired, on September 4, 1959

Albert R. Lamb, Professor Emeritus of Clinical Medicine and Consultant, Presbyterian Hospital, on November 22, 1959

Gerald F. Machacek, Associate Clinical Professor of Dermatology and Attending Dermatologist, Presbyterian Hospital, on November 8, 1959

Robert Muller, Instructor in Medicine and Assistant Attending Physician, Presbyterian Hospital, on January 12, 1959

Frank D. Rossomondo, Associate in Medicine and Associate Visiting Physician, Chest Service, Bellevue Hospital, on March 8, 1959

Irving J. Sands, Consultant in Neurology, Presbyterian Hospital, on October 22, 1958

Victor Ross, Research Associate in Biochemistry, on August 9, 1958

Harry H. Shapiro, Associate Clinical Professor of Anatomy, on December 23, 1958

Frank P. Shepard, Assistant Professor of Pathology and Assistant Visiting Pathologist, Delafield Hospital, on October 13, 1959

Herman Vollmer, Assistant Pediatrician, Vanderbilt Clinic, on October 11, 1959

Edwin G. Zabriskie, Professor Emeritus of Clinical Neurology and Consultant, Presbyterian Hospital, on January 13, 1959

The following retirements are reported:

Robert G. Bloch, Clinical Professor of Medicine, Montefiore Hospital, effective June 30, 1959

John H. Dunnington, Professor of Ophthalmology, Chairman of the Department of Ophthalmology, Attending Ophthalmologist and Director of Service, Presbyterian Hospital, effective June 30, 1959

Paul Gross, Clinical Professor of Dermatology and Attending Dermatologist, Presbyterian Hospital, effective June 30, 1959

Harold D. Harvey, Professor of Clinical Surgery and Attending Surgeon, Presbyterian Hospital, effective June 30, 1959

Maxwell Karshan, Professor of Biochemistry, effective December 31, 1959

The following emeritus designations were made by the Trustees:

John H. Dunnington, Professor Emeritus of Ophthalmology and Consultant, Presbyterian Hospital, effective July 1, 1959

Harold D. Harvey, Professor Emeritus of Clinical Surgery and Consultant, Presbyterian Hospital, effective July 1, 1959

Maxwell Karshan, Professor Emeritus of Biochemistry, effective January 1, 1960

The following promotions were made, effective July 1, 1959, unless otherwise indicated:

Sidney Blumenthal, Associate Professor of Clinical Pathology

Mary E. Callahan, Associate Professor of Physical Therapy

Arthur C. Carr, Associate Professor of Medical Psychology

Constance P. Cleary, Associate Professor of Nursing
George T. Crikelair, Associate Professor of Clinical Surgery

Bernard F. Erlanger, Associate Professor of Microbiology

M. Irene Ferrer, Associate Professor of Clinical Medicine (Bellevue)

B. Raymond Fink, Associate Professor of Anesthesiology

Marie L. Franciscus, Associate Professor of Occupational Therapy

M. Jack Frumin, Associate Professor of Anesthesiology

Aaron Himmelstein, Associate Professor of Surgery

Kathleen L. Hussey, Associate Professor of Parasitology

Maxwell Karshan, Professor of Biochemistry

Werner Loewenstein, Associate Professor of Physiology, effective September 1, 1959
Margaret R. Murray, Professor of Anatomy
Shih-Hsun Ngai, Associate Professor of Anesthesiology
Beatrice C. Seegal, Professor of Microbiology, effective January 1, 1959
Anna L. Southam, Associate Professor of Obstetrics and Gynecology
Joseph Ransohoff, Associate Professor of Clinical Neurological Surgery
Stuart W. Tanenbaum, Associate Professor of Microbiology
Juan M. Taveras, Professor of Radiology

The following new appointments were made:

Stanley E. Bradley, Chairman of the Department of Medicine, Attending Physician and Director of the Medical Service, Presbyterian Hospital, effective July 1, 1959
A. Gerard DeVoe, Edward S. Harkness Professor of Ophthalmology, Chairman of the Department of Ophthalmology, Attending Ophthalmologist and Director of the Ophthalmology Service, Presbyterian Hospital, effective July 1, 1959
Gabriel G. Nahas, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist, Presbyterian Hospital, effective July 1, 1959
Calvin H. Plimpton, Assistant Dean, from September 1, 1959
Nevin S. Scrimshaw, Adjunct Professor of Public Health Nutrition, effective January 1, 1959
Melvin D. Yahr, Assistant Dean, effective July 1, 1959

Effective July 1, 1959, Andre Cournand was appointed Westchester Heart Association Professor of Cardiovascular Research.

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability, was given to James R. Carter, Jr., Class of 1959. The Borden Undergraduate Research Award was given to Paul B. Sigler, for outstanding research work during the medical course. The Joseph Garrison Parker Award was given to Maclyn E. Wosnitzer. The Department of Psychiatry Prize for best work in Psychopathology by a second year student was awarded to Susan J. Standfast, Class of 1961. The Roche Award was given to Martin Cohen. The Joseph Mather Smith Prize, awarded to the graduate whose essay or original research in medical subjects is deemed by the Committee on Award to be the most meritorious, was given to Dr. Paul A. Marks, Class of 1949.

The Coakley Memorial Prize was given to William P. Urschel. Howard B. Corning was awarded the Frederick P. Gay Memorial Award. The William Perry Watson Prize in Pediatrics

was given to Paul S. Lietman. The Alpha Omega Fraternity Award and the Van Woert Scholarship Prize was given to Stanley M. Steinerman. Russell R. Garofalo was awarded the Ella Marie Ewell Certificate. Roy Boelstler was given the Operative Division Prize. The Certificate for Excellence in Pedodontics (Class of 1929 Award) was given to Stephen M. Markow. Stephen M. Murphy was given the Psi Omega Fraternity Award.

The Graduate and Postgraduate Program

During the past year the graduate and postgraduate programs have shown an increase in the number of enrolled students. In part, this is due to the expansion of the National Institutes of Health Training Grants program, increasing support of Fellowships through private health agencies and the introduction of new courses in our curriculum.

At present, some 288 Interns and Residents, as well as 216 Fellows of which sixty-two are Visiting Fellows, are undergoing training at the Medical Center. In addition, the staff is responsible for all or a part of the training of physicians in hospitals affiliated with the Medical School. Despite this imposing number, it represents only a small fraction of first-rate scientists who apply each year, but cannot be accommodated because of limitations in space.

The postgraduate program offered eighty-nine courses during the past eighteen months. These courses were designed to acquaint the general practitioner with the latest advances in medicine, as well as the specialist with the most recent developments in his field. Some 1,200 physicians were registered for these courses, as follows:

	<i>Number of Courses</i>	<i>Number of Students</i>
Mount Sinai	37	303
Montefiore	19	116
Columbia-Presbyterian Medical Center	29	765
Joint Diseases	2	14
Bellevue	2	2
Total	89	1,200

Courses attracting the most interest are symposia on specific topics offered for specialists. These courses tend to be inter-disciplinary and

present a complete review of the subject under discussion. It is hoped that additional courses along these lines will be developed during the coming year.

The degree of Doctor of Medical Science was awarded to Drs. John N. Potanos and Emanuel A. Friedman at the commencement exercises in June. This degree has recently been revised so that qualified Residents and Fellows will be required to carry out their studies in one of the basic science departments. It is felt that this will broaden the base of information and research experience for candidates desiring this degree. There are at present five physicians registered in various departments working for this degree.

Student Health Service

The Student Health Service, under the faithful direction of Dr. Albert R. Lamb, Jr., continues

to meet the health needs of the students and employees of the Faculty of Medicine.

During the past academic year 1958-59 there were 404 routine physical examinations on students. Routine chest X-rays and routine dental examinations, including X-rays, are available to the student body. Besides providing routine health services, the Student Health Service continues to help students in other ways, such as rendering premarital examinations, completing insurance forms and offering other similar services.

The Personnel Health Service, with Dr. Joseph J. Barlow, Physician-in-Charge, has performed 233 pre-employment physical examinations. In addition, there have been 806 routine physical examinations, office visits and the like.

H. HOUSTON MERRITT, M.D.

Dean of the Faculty of Medicine

March 4, 1960



Reports of Departments
and Services

Anatomy

WILFRED M. COPENHAVER, *Professor and Acting Chairman of the Department*

In 1959, the Anatomy Department made extensive modifications in its teaching program in conjunction with the over-all curricular changes inaugurated by the Medical School. At the same time, the Department maintained a high level of productivity in research and expanded its program for graduate students.

Teaching Activities

The new curriculum brought changes in all courses in anatomy for first year medical students. Postponement of gross anatomy and neuroanatomy to the second and third trimesters involved not only changes in scheduling, but modifications in the courses. Since histology now precedes gross anatomy and parallels biochemistry, more histochemistry is being introduced into histology. The presentation of gross anatomy in parallel with physiology facilitates the emphasis on functional anatomy which has been a general policy.

Neuroanatomy has been incorporated in a multidisciplinary course along with neurophysiology, neurochemistry, neurology and psychiatry.

Embryology has been incorporated in an interdepartmental course in statistics-genetics-embryology. Lectures in statistics have been given by the Department of Public Health and Administrative Medicine; those in genetics by the Departments of Medicine, Anatomy, Biochemistry and Microbiology; those in embryology by the Departments of Anatomy, Pediatrics and Obstetrics and Gynecology. Embryology includes material on fetal physiology and on changes at the time of birth.

In addition to courses for first year medical students, the Anatomy Department gives six courses for dental students and participates in postgraduate courses for residents in orthopedic surgery, ophthalmology, otolaryngology and neurology. Members of the department have also continued to give courses in the Department of Nursing, the School of General Studies and the Summer Session.

There has been an expansion in programs for

predoctoral graduate students and for postdoctoral fellows. The training of selected individuals in neuroanatomy has been aided by a grant from the National Institute for Neurological Diseases and Blindness which established a program in this field under the direction of Professor Malcolm B. Carpenter. The program has been inaugurated with the appointment of three full time postdoctoral fellows.

Research Activities

An expansion in research has been facilitated by increased grants for technical assistance and equipment and by continued collaboration with other departments.

Professor Frederic J. Agate, in collaboration with Dr. William A. Silverman, Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician, is continuing studies of temperature control in premature infants. In collaboration with Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology), and with Dr. Sam M. Beiser, Associate Professor of Microbiology, and Dr. Bernard F. Erlanger, Associate Professor of Microbiology, Dr. Agate is studying the endocrinological properties of steroid protein conjugates. In collaboration with Dr. Landrum B. Shettles, Assistant Clinical Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, Dr. Agate is investigating changes in the rate of blood flow in the uterine endometrium. Dr. Agate is also collaborating with Dr. Lewis J. Doshay, Associate in Neurology and Associate Attending Neurologist, on improvements in electronic recording machines for measuring rigidity and tremor.

Professor Edmund Applebaum is collaborating with Dr. Henry P. Levy and Dr. Austin H. Kutscher, Assistant Professor of Dentistry, in studying the effects of massive doses of certain antibiotics on oral tissues. Dr. Applebaum is also collaborating with Dr. Edward V. Zegarelli, Edwin S. Robinson, Professor of Dentistry and At-

tending Dental Surgeon, and Dr. Kutscher in studies on the relation of cystic fibrosis to dental tissues.

Professor Malcolm B. Carpenter has continued his work on the correlation of structure and function in the central nervous system along the following lines: studies of the functional relationships between the fastigial nuclei and the labyrinth in the cat; studies of the anatomical connections of the fastigial nuclei, labyrinth and vestibular nuclei; studies which show that lesions of the descending vestibular nucleus in the cat provoke disturbances of equilibrium similar to those following labyrinthectomy, but with preservation of righting reactions; studies of the spinal tracts mediating subthalamic hyperkinesia in the monkey indicating that the so-called "extrapyramidal" motor system is probably not an independent motor unit but is dependent on the integrity of the corticospinal system; studies of the rubral efferent projections in the cat.

Professor Herbert Elftman has studied the histochemical responses of the uterus to steroid hormones in the rat and mouse. By injecting the hormone into the lumen of the castrate uterus it is possible to test exceedingly small quantities. Attention has been given to the order of appearance of responses to estrogens with particular reference to endometrial edema, glycogen increase in the longitudinal muscle, disappearance of basal phospholipid from the epithelium, increase in size of the Golgi apparatus, and mobilization of alkaline phosphatase. Histochemical investigations on the pituitary gland have been continued, with particular emphasis on the cytological changes in the gland of the rat following removal of the gland from direct hypothalamic control by transplantation to the kidney capsule. Evidence for the cytological origin of thyrotropic hormone and growth hormone has been obtained from studies of the pituitary gland of the dwarf mouse, in collaboration with Dr. Otto Wegelius, a Visiting Fellow in the Department of Ophthalmology. Professor Elftman has continued to serve on the Committee on Prosthetics Research and Development, sponsored by the National Research Council.

Professor Charles A. Ely has completed studies on the effects of antisera to crude sheep pituitary extracts on the growth and differentiation of ex-

perimentally induced ovarian tumors. No tumors were found in mice given antisera whereas fifty-one per cent of the animals developed tumors in the absence of antisera. The effects of antihormone serum on the normal mouse reproductive system are being studied.

Professor Dorothy D. Johnson is continuing studies on the histology of transplanted tooth buds in the cat and rat.

Professor Emanuel B. Kaplan is continuing his studies on the morphology of the human foot in comparison with that of other primates. Dr. Kaplan is conducting studies, also, on the morphology of the cervical spine in relation to Luschka's joint; the comparative anatomy of the mammalian knee joint and is completing a book on the functional and surgical anatomy of the foot. During the year, Dr. Kaplan had under his direction Dr. Uberto Mangini, a Fellow from the Instituto Ortopedico, Toscano, Italy who was doing research on the nerve supply of the flexor pollicis longus muscle.

Professor Melvin L. Moss is continuing studies on cranial morphogenesis and on induction and inhibition of osteogenesis. Some of the work has been done in collaboration with Professor Charles R. Noback and some with Dr. George F. Crikelair, Associate Professor of Clinical Surgery and Associate Attending Surgeon. Dr. Moss is also actively engaged in a study of morphogenesis and repair of non-osteocytic fish bone. Dr. Moss is serving as an Associate Editor of the American Journal of Physical Anthropology, as a member of the Editorial Board of the Cleft Palate Bulletin, and as a member of the Editorial Board of the Archives of Oral Biology.

Research in Professor Margaret R. Murray's laboratory for cell physiology has followed two main lines. The first is concerned with the etiology of mammary carcinoma, especially the mouse tumor which is transmitted by a factor in the milk. This carcinogenic agent has been propagated in cultures by Professor Etienne Lascargues and its genesis at the surface of the tumor cell has been described. Professor Dan Moore has characterized its physical properties. The second area under Professor Murray's investigation comprises problems of the nervous system. The primary goal has been to create *in vitro* an environment in which small portions from dif-

ferent regions of the nervous system can develop and be maintained in normal function under continuous observation at the cellular level. Material now under study consists of dorsal-root ganglia from embryonic chicks and fetal rats, somites from chick embryos, and spinal cord and cerebellum from newborn rats. Engaged in this work are Drs. Murray Bornstein, Joseph Pearincott, and Takeshi Yonezawa and Mrs. Edith R. Peterson.

Professor Charles R. Noback, in collaboration with Dr. James B. Campbell, Assistant Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, and Professor C. Andrew L. Bassett, Assistant Professor of Orthopedic Surgery and Assistant Attending Orthopedic Surgeon, has studied the morphologic aspects of neural regeneration across gaps in peripheral nerves and in spinal cords of adult cats. In collaboration with Dr. Melvin L. Moss, he has made a longitudinal study of epiphyseal fusion in the hand of adolescents. Dr. Noback is also continuing his work on a comparative analysis of the brain stem nuclei of mammals. He gave the 1959 James Arthur Lecture at the American Museum of Natural History on the Heritage of the Human Brain.

Professor George D. Pappas is in charge of the electron microscope laboratory where one of the problems of investigation deals with the general phenomenon of fluid transport. This is being studied in ciliary epithelium, the choroid plexus and in amebas. The fine structure of capillaries is being correlated with functional states of the tissue in respect to permeability. Morphologic changes are being correlated with the development of the "blood-aqueous" barrier (ciliary body), the "blood-brain" barrier (cerebral cortex) and the structure and density of the capillary bed during cardiac growth. Further studies are also being made on the fine structure of mitochondria and on coiled structures, presumably complexes of DNA, found in the nuclei of ameba. Collaborative work is in progress on various aspects of the above projects with Professor Wilfred M. Copenhaver, Professor George K. Smelser and with two graduate students, Mr. Philip W. Brandt and Miss Virginia M. Tennyson.

Professor William M. Rogers is engaged in studies which aim to establish, under experi-

mental and operative conditions, phonocardiographic criteria useful in the diagnosis of congenital and acquired cardiac lesions. Studies on three types of defects have been completed, namely, those involving the pulmonary valve; atrial and ventricular septal defects; and patent ductus arteriosus. Co-investigators include Dr. James R. Malm, Instructor in Surgery and Assistant Attending Surgeon, Dr. James S. Harrison, and Dr. Antonio Demetz, Fellow from Padua, Italy. Professor George H. Humphreys, II, of the Department of Surgery has sponsored and collaborated in the program. Dr. Rogers has also studied changes in bones and joints subsequent to atrophy of muscles and hypertrophy of muscles.

Professor Shih-Chang Shen is engaged in research on the cytochemistry of synaptic differentiation. As a basic model of a monosynaptic structure, the differentiation of the myoneural apparatus was studied. The cytological and biochemical aspects of the motor endplates were investigated during normal and experimentally modified cytogenesis. Special attention was given to the interaction between the neural and muscular elements. Observations thus far warrant the conclusion that while the initial phase of the differentiation is intrinsic with the muscle cells, the final elaboration of the endplate requires participation of the axonal termination.

Investigations in the laboratory of Professor George K. Smelser include the following: the development of corneal transparency; studies, in collaboration with Dr. Otto Wegelius, a Fellow from Helsinki, to determine the target cells on which pituitary hormones act to produce exophthalmos; the behavior of sulfated mucopolysaccharides in the cornea as studied by radioautographic methods; electron microscopy of the ciliary epithelium, in collaboration with Professor George D. Pappas, and methods for studying the problem of regeneration of Descemet's endothelium.

Professor Wilfred M. Copenhaver is engaged in research on cytodifferentiation of cardiac muscle as studied by histochemical methods and by electron microscopy, in collaboration with Professor George D. Pappas; histochemistry of the specialized conduction fibers of the heart; histogenesis of cardiac tissue as studied by tritium-labeled thymidine, in collaboration with Profes-

sor George K. Smelser, and effects of x-irradiation on heart development, in collaboration with Dr. Roberts Rugh, Associate Professor of Radiology.

Acknowledgments

The research work of the various members of

the Department has been aided by grants from the American Heart Association, Dunlevy Milbank Foundation, Helen Hay Whitney Foundation, Robert Chuckrow Construction Co., Inc., National Science Foundation, Squibb Institute for Medical Research and several divisions of United States Public Health Service.

Anesthesiology

EMANUEL M. PAPPER, *Professor and Chairman of the Department
Director of Service*

There were many changes in the staff during 1959. Dr. Virginia Apgar resigned after many years to assume a position of executive responsibility in the National Foundation. Her loss was great but the work she has undertaken with the National Foundation will make her notable talents available on a nation-wide scale. Dr. Duncan A. Holaday was appointed Professor of Anesthesiology at the University of Chicago and Director of its Anesthesiology Service. His appointment is also one in which all his former colleagues in this department take considerable pride. Finally, Drs. Seamus Lynch, Albert Levy and Irving Berlin resigned to enter private practice of anesthesiology in New York City.

Dr. Virginia Apgar was succeeded by Dr. Frank Moya, Associate in Anesthesiology, as Anesthesiologist in charge of the Anesthesiology Service in the Sloane Hospital for Women. Dr. Gabriel G. Nahas replaced Dr. Holaday. Drs. Harold Cordner and Sol Shnider joined the staff as Instructors in Anesthesiology and Assistant Anesthesiologists after completing their training in our residency and fellowship programs.

The department received a training grant from the National Institutes of Health to further the training of anesthesiologists for careers in academic anesthesiology. It was one of five university departments of anesthesiology in the country to receive this support. The first two Fellows, Dr. J. Selwyn Crawford and Dr. Harold J. Cordner have already begun careers in academic anesthesiology. Dr. Crawford has joined the Department of Anesthesiology at the University of Chicago. At the present time there are two trainees. Dr. Gerald Wolf is working on problems of extra-corporeal circulation with the group headed by Dr. Aaron Himmelstein, Associate Professor of Surgery and Associate Attending Surgeon. Dr. Ronald L. Katz is working in collaboration with Professor Shih-hsun Ngai under the supervision of Dr. Shih-Chun Wang, Professor of Pharmacology, on the central effects of

ether and in the field of antagonists to muscle relaxants.

There have been several changes of consequence in the organization of our activities. The Operating Room and Anesthesia Committee gave the Director of the Anesthesiology Service administrative control of scheduling and other activities in the operating rooms. This has decreased the waiting for operation of patients in the hospital. The reconstruction of the sterilizers and parts of the operating rooms on the north side of the eighteenth floor has been completed. The patient and devoted cooperation of all of the Surgical Services and the Nursing Service helped maintain the standards of quality in operative surgery in the face of real physical difficulties and an expanding volume of operations.

The John A. Hartford Foundation, Inc. generously supported and made possible the opening and equipping of the special care room for open heart surgery. Three members of the Anesthesiology Service are part of the team concerned with the care of these patients before and during operation and in the special recovery room.

The Clinical Service

During 1959, 22,170 patients were anesthetized for surgical procedures. General anesthesia was used for 17,498 patients and regional anesthesia was employed for 4,672 patients.

Muscle relaxants were employed on 8,374 occasions. These figures indicate a gradual but definite increase in the use of regional anesthesia. Of particular consequence this year, was the further improvement of the technique for brachial plexus block which now obviates completely the possibility of producing pneumo-thorax and also improves the success rate of this procedure. Changes in general anesthesia have consisted in a further increase in the use of mechanical ventilators. There has also been a simplification of some methods of monitoring important parameters of clinical care. Muscle relaxants have continued to

maintain an important place in the management of general anesthesia.

Drs. Herbert Rackow and Ernest Salanitre have continued their development of practical measures to improve anesthesia for pediatric patients. They reviewed 238 cases of infants up to the age of twelve weeks who were anesthetized for a variety of surgical procedures. The purpose of this review was to determine the effect of muscle relaxants in the newborn and in the very young infant. They found that the incidence of ventilatory difficulties was greater when d-tubocurarine was used than when succinylcholine was given. It was their opinion that the problems in respiration probably arose from relative overdosage rather than hypersensitivity to curare as compared with succinylcholine. An additional factor of importance was that any relaxant administered to this young age group increases the tendency of infants to develop hypothermia when they are operated on in a cool environment. Possibly, the reason for the development of hypothermia is the inhibition of shivering by the relaxant. Drs. Rackow and Salanitre also reviewed the records of 320 children who were operated upon for the repair of a cleft lip or palate. Two groups were compared; one group in a five year period ending in 1953; a second group during 1957-58. A standard technique of oro-tracheal ether, nitrous oxide oxygen anesthesia was used with a non-rebreathing technique in the second series. The total complication rate fell from 55% in the first group to 35% in the standardized second group. Of even greater importance was the decline of serious respiratory complications from 21% in the earlier series to 5% in the more recent one. This represents a real advance in pediatric anesthetic care.

Teaching Activities

As in previous years, the department's major teaching activity was the residency program which remains strong and has been developed further along the lines described in previous reports. The department was the host this year to the Annual Meeting of the Association of University Anesthetists and prepared a scientific program for the Association. The residents and staff participated and had the benefit of attending all

the scientific sessions which were conducted during a weekend.

Research Activities

The department continues to labor under the handicap of inadequate space and physical facilities. However, despite these difficulties, its investigative productivity continued on a high level of quality. Support for these investigations is gratefully acknowledged, to the National Institutes of Health, the National Foundation, the Department of the Army, Burroughs Wellcome and Company, Inc., Abbott Laboratories, and the United States Public Health Service.

Dr. Holaday, in collaboration with Drs. Ngai, Edgar C. Hanks and B. Raymond Fink, studied the mechanism of the neuromuscular blocking action of Imbretil and its antagonism by certain anti-curare compounds. Anesthetized patients were studied with the aid of electromyographic techniques, blood gas measurements, and monitoring of the arterial pH to evaluate the relationship between respiratory activity during general anesthesia and peripheral neuromuscular function. The effects of "antagonists" such as thiamine were also evaluated. These workers also studied respiratory center activity in anesthetized man and observed the effects of artificial respiration and changes in carbon dioxide tension on the drive to respiration. It was concluded that the respiratory center responds in a stable manner to the chemical stimulation of CO₂ during general anesthesia, but it adapts rapidly to the stimulation and inhibition of reflexes initiated by altering the airway pressure. Respiratory activity is inhibited temporarily by the rapid injection of intravenous barbiturates. It tends to vary over a rather narrow range during other types of anesthesia. There is a remarkably close relationship between the integral of the electromyogram of the diaphragm with the volume of air exchanged when resistance to respiratory movements is maintained at a constant level.

Dr. Holaday, Dr. Cordner and Dr. Paul Gerst, Resident in Surgery, studied pulmonary blood flow during acute hemorrhage in the anesthetized artificially respired dog. They observed that there were large portions of the lung through which there was cessation of blood flow when hypotension was induced by acute hemorrhage. Early

studies suggested that a positive-negative pattern of artificial respiration appeared to minimize this pulmonary vascular collapse which occurred during graded hemorrhage. They also showed that succinylcholine injected intravenously influenced the development of a significant CO_2 tension difference between expired air and arterial blood. This phenomenon resulted from the failure of perfusion of ventilated alveoli and could be prevented by doses of atropine of 1 mg. or greater. The speculative possibility exists that succinylcholine has an effect upon the tone of the pulmonary blood vessels or on the distribution of pulmonary blood flow in the anesthetized animal.

Dr. Lester C. Mark and Dr. Holaday continued their studies of cardiac output during general anesthesia. The dye dilution technique was explored further by the use of fluorescent dyes. This method did not turn out to be practical and led to the conclusion that the use of a non-diffusible light absorbing dye offered the most feasible method for measuring cardiac output.

Dr. Holaday and Mr. Robert de Witt, a medical student developed an electric analog of the lung. Mr. de Witt was aided by a Radio Corporation of America Fellowship. After Mr. de Witt assembled the computer, experimental work began. It was found that current flows from a constant current generator could provide curves from the analog which imitated quite exactly the pressure-volume responses of the normal human lung. Further studies are planned in which the resistance and the compliance of the analog will be varied to simulate various diseased states. The pressure-volume responses of the analog will be recorded together with information on the distribution of flow within the analog. It is hoped in this manner to facilitate the interpretation of pressure-volume curves of normal and diseased patients during artificial respiration and during general anesthesia.

Professor Herman Schwartz completed a study of open drop fluothane for ophthalmic examinations in 400 children. It was determined that there was quick induction of anesthesia, rapid recovery, minimal incidence of vomiting and no important effects on the pulse or blood pressure if atropine is used for premedication.

Dr. Schwartz began his study of the oculo-vagal reflex in the cat and the rabbit. This

phenomenon, which has potentially serious implications in clinical anesthesia, was not reproducible in these animals either with pressure on the eye or the pulling of the extra-ocular muscles. A more suitable animal species is being sought to aid in interpretation of the clinical problem.

Dr. Cyril Sanger has been studying methods of measuring tissue oxygen tension *in vivo* in preparation for the study to be undertaken in collaboration with the Department of Radiology on the use of high atmospheric pressures of oxygen with radiation therapy for malignant diseases. The apparatus necessary for this project is almost completed and studies will begin in the immediate future.

Professor Gabriel G. Nahas has continued his investigations on the influence of the amine buffer THAM on acid base balance in laboratory animals and in man. This buffer has the capacity of binding CO_2 thus correcting hypercapnic acidosis. Currently, Dr. Nahas in collaboration with Dr. Serge Dos, is investigating the mechanism of the elevated intracranial pressure during hypercapnic acidosis and the mechanism of the hypoglycemic activity caused by THAM. He is also studying the effects of amine buffered fluid therapy in the course of hemorrhagic shock in collaboration with Dr. Arnold Mittleman, Resident in Surgery, and Dr. William Manger, Instructor in Medicine and Assistant Physician.

Professor Lester C. Mark has continued his studies of the intravenous anesthetics in collaboration with Professor Leonard Brand and Drs. John J. Burns and Peter Dayton of the National Heart Institute. Some of their studies are concerned with the relationships between the site and mechanism of the formation of the cerebro-spinal fluid with the penetration of anesthetic agents into the central nervous system. The barbiturates enter and leave the brain at different rates of speed in proportion to the degree of their lipid solubility. It seemed reasonable, therefore, to look for differences in their rates of passage into and out of cerebro-spinal fluid. These workers showed that there was a delay in the passage of barbitol from the blood stream into the central nervous system. The drug appears in the cerebro-spinal fluid even more slowly than it does in the brain. In contrast, thiopental passes freely into the central nervous system. The experimental

findings are interpreted as evidence consistent with the concept that barbitol passes from the plasma into the extracellular fluid of the brain and then to the cerebro-spinal fluid rather than directly via the choroid plexus.

Methohexital was also studied by these investigators. A chemical method was devised for its quantitative analysis in biological material. The drug appears to be a potent short acting barbiturate with prompt onset of action. At the present, its physiological disposition is under investigation.

A non-barbiturate intravenous anesthetic with the property of stimulating respiration has been studied in a preliminary fashion. Unfortunately, the drug is almost insoluble in water. Its vehicle propylene glycol and sodium benzoate is undesirable because of damage to the walls of veins. More recently, an emulsion has become available but has not proved satisfactory as yet for clinical or physiological studies.

Professors Mark and Brand, in collaboration with Professors Nahas and Robert M. Epstein, have studied the respiratory effects of THAM in the effort to gain more data on the relative importance of pH or the P_{CO_2} in the immediate environment of the respiratory center. Unanesthetized trained dogs are being studied for this purpose.

Drs. Mark and Brand also studied the mechanism and the treatment of convulsions associated with large doses of local anesthetics. The question was whether pharmacological antagonism with depressant drugs such as the barbiturates or symptomatic suppression of convulsions with muscle relaxants is the better method of treatment. Data are being collected on whether the harm from convulsions due to local anesthetic agents is due to anoxia or to some other cause.

Drs. Brand, Seamus Lynch and Albert Levy studied patients who were operated upon in the prone position for the correction of scoliosis. They showed that a controlled volume mechanical respirator supported ventilation in a more efficient manner than any other method of respiration.

Professor Vance Lauderdale, Jr. has continued his studies of the complications and mortality from anesthesia. These records have proven most helpful in keeping abreast of the anesthetic problems to be solved in the clinical care of patients.

Professor Charles C. Wycoff has continued to

study the effects of acetyl strophanthidin in laboratory animals. He found that there was some variation in venous pressure following digitalizing doses of this drug. The venous pressure usually rose abruptly and significantly and then returned to normal values in a relatively short period of time. There was rarely a reduction below normal pressures. Dr. Wycoff also studied the effect of succinylcholine on the blood pressure and the pulse rate of anesthetized patients.

Dr. L. Stanley James continued his studies of the biochemical and hemodynamic readjustments in the neonatal period. More detailed information on the rate of readjustment to normal acid base balance has been obtained and some of the side effects of asphyxia at birth in relation to potassium and lactic acid metabolism have been studied. Intracardiac pressure measurements are being correlated with heart size, heart murmurs and the clinical condition of the infant. The purpose of the last study listed is to determine whether cardiac failure has any part in the respiratory distress in the neonatal period.

These studies of Dr. James and his associates suggest that there is a great lability of oxygen levels in the newborn and also suggest that the degree of acidosis is a more reliable indication of the period of asphyxia than is the measurement of oxygen saturation or tension. The infants with a mild metabolic acidosis at birth may have a relatively high or extremely low oxygen saturation. In the absence of excessive medication or anesthesia, these infants are always vigorous. On the other hand, those infants with a profound metabolic acidosis always have low oxygen levels at birth and are invariably depressed. The implications of these studies are of considerable interest and importance. Acidosis increases the toxic action of potent anesthetic agents. Renal function is diminished with a reduction of pH and renal activity is apt to be greatly impaired when the pH of arterial blood reaches 7.0. Normal enzymatic activity is also impaired with sharp reductions in pH. Cardiovascular collapse is threatened when the arterial pH indicates severe acidosis. The implication for clinical care is that the arterial blood pH of a newborn which may fall very rapidly should be restored as quickly as possible to normal to avoid the potential and actual complications of acidosis at birth. Proper artificial

respiration at birth is mandatory in the presence of apnea.

Dr. Frank Moya studied the placental transmission of succinylcholine in collaboration with Dr. Niels Kvisselgaard of the resident staff. Using a bioassay technique, they found that succinylcholine could not be detected in the fetal circulation unless massive doses were given to the mother. There was no effect upon muscle power of the newborn or its ability to breathe. Studies completed in collaboration with Dr. Lawrence Margolies of the Department of Obstetrics and Gynecology suggested that enzymatic hydrolysis of succinylcholine was not responsible for these findings. Dr. Moya and his colleagues believe that the placental barrier to succinylcholine may be a physical phenomenon related to the lipid insolubility of this substance.

Dr. Moya continued to prepare some obstetrical patients for delivery by hypnosis to provide control patients for the multi-departmental study in cerebral palsy. The major purpose of hypnosis is to have babies born of mothers in the combined project who do not receive sedative or anesthetic drugs during labor or delivery. In this way, a clinical and biochemical evaluation of the newborn can be more effectively performed as controls for those patients who are sedated or anesthetized. Dr. Moya has also continued his studies of chloroform and nitrous oxide-oxygen analgesia techniques for labor and delivery. These studies include both clinical and biochemical aspects. Two new narcotics alleged not to cause depression of respiration or circulation were studied and not found particularly effective in providing analgesia during labor. In collaboration with Dr. J. Selwyn Crawford, Dr. Moya studied the placental transmission of promethazine. They found that this drug passed readily across the placenta to the fetal circulation and may therefore contribute to the depression of the newborn. Dr. Moya and Dr. James have studied the effects of breathing through newly designed perforated plastic bags in an effort to evaluate commercially useful materials. This study was performed as a measure helpful for the public health and welfare in view of the widely publicized asphyxial deaths from plastic bags. Preliminary studies on both unanesthetized human volunteers and anesthetized patients indicate that this specially pre-

pared perforated plastic material is safe for respiration for reasonable periods of time.

In collaboration with Dr. Sol Shnider, Dr. Moya is investigating the mechanism of failure to produce epidural anesthesia with 2-chloroprocaine when lidocaine was uniformly successful after failures with the former.

Dr. B. Raymond Fink continued his studies of the physiological control of respiratory muscles during anesthesia in collaboration with Drs. Ngai, Holaday and Hanks. During controlled respiration, electromyographic activity of the diaphragm disappeared at an arterial P_{CO_2} , which was approximately 10 mm. of mercury below the P_{CO_2} associated with the patient's spontaneous breathing. These observations were made during thiopental nitrous oxide oxygen anesthesia and controlled respiration with a mechanical ventilator. Dr. Fink had also devised a method for quantitatively evaluating the state of relaxation of the muscles of the abdominal operations with the aid of the integrated electromyogram. Thirty-three patients were studied in this fashion, and the results were so encouraging that Dr. Fink is investigating the possibility of using the electromyogram in an automatic system for the control of muscular relaxation during abdominal surgery. Electromyography of the diaphragm has been useful also in observing the spontaneous respiratory rhythm which can be monitored even during controlled respiration. This technique has made it possible to provide effective ventilation during neuro-surgical operations near the medullary centers of respiration and still detect respiratory arrhythmias without the need to observe the mechanical effects of respiration.

Dr. Cordner was a member of the group headed by Dr. Aaron Himmelstein. He collaborated in the evaluation of the characteristics of the Kay Cross oxygenator and began studies with the Clark Electrode to measure tissue oxygen tensions. In addition, Dr. Cordner assisted Dr. James B. Campbell, Assistant Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, in investigations on the influence of hypothermia in modifying the process of regeneration of a severed spinal cord in the cat.

Dr. M. Jack Frumin, in collaboration with Drs. Rackow and Salanitre, studied the analgesic-anesthetic state further in continuation of previously

undertaken work. The rate and pattern of uptake of fluothane and chloroform in man were defined. They also studied the kinetics of nitrous oxide transfer in patients. Dr. Lynn Greene, a United States Navy Trainee in research in anesthesiology assisted these workers. The importance of these studies is the development of a more precise understanding of the physico-chemical factors that are involved in the physiological disposition of the anesthetic gases and vapors. These investigations have never been performed quantitatively in man. When such data are collected and systematized, there will be a better understanding of the mechanisms of action of the agents including predictability as to their behavior in man.

Dr. Robert M. Epstein continued his studies on the effects of nitrous oxide, succinylcholine and hypercapnia in the dog on hepatic bromsulphalein transport and storage. This study did not yield conclusive evidence as to the nature of the changes in the removal pattern, but it appeared as though the transport maximum for bromsulphalein was depressed during acidosis. Dr. Epstein in collaboration with Dr. M. Jack Frumin also studied apneic oxygenation in man. There was a rise in plasma potassium during apneic oxygenation. Surprisingly enough, however, there was only minimal interference with cardiac rhythm under conditions of forty-five minutes of total apnea despite the development of severe acidosis. A safety factor of importance was the preservation of full oxygenation.

Dr. Ngai studied the muscle relaxant Imbretil in anesthetized patients and in the cat. He found that Imbretil is a potent muscle relaxant with a long duration of action. Its effect is cumulative. Imbretil is regularly potentiated by prostigmine and edrophonium in the cat. This finding is contrary to previous studies elsewhere. Dr. Ngai studied the action of this relaxant in man in collaboration with Drs. Hanks, Fink and Holaday. They showed that thiamine antagonized Imbretil during the early phase of paralysis. It was observed that respiratory muscle activity cannot be used as a valid method of evaluating the effects of muscle relaxants unless the depth of anesthesia and the arterial P_{CO_2} are rigidly controlled. An experimental approach to this problem has been developed and should be useful to evaluate muscle relaxants and their antagonists in the future.

These findings criticize severely the commonly accepted methods of studying the action of muscle relaxants in man. Dr. Ngai, in collaboration with Dr. Irwin B. Wilson, Associate Professor of Biochemistry (Neurology), studied the mechanism of action of thiamine as an antagonist to both competitive and depolarizing types of muscle relaxants. The activity of various derivatives and fragments of thiamine in modifying muscle twitch responses and neuromuscular block produced by curare and C10 has been studied. It is the purpose of this investigation to determine which part of the thiamine molecule is necessary for the various qualities that the parent compound exhibited. Out of this study, it is hoped that a clinically useful and versatile muscle relaxant antagonist may be developed.

In collaboration with Dr. Ronald Katz, the phenomenon of ether hyperpnea is being analyzed. The relative influence of the stimulation of the afferent nerves and the direct central action of this agent are being compared. Dr. Ngai, in collaboration with Drs. Hanks and Fink, has been studying a new anesthetic vapor (a fluorinated ether) developed by Dr. Joseph Artusio at Cornell. Several patients have been anesthetized with this compound. It is interesting in that it appears to produce good muscle relaxation in relatively light levels of anesthesia.

Dr. Gerald Wolf has been working on the effects of cardioplegia produced by profound hypothermia. Studies in animals have been carried out under the supervision of Dr. Aaron Himmelstein of the Department of Surgery. The relative merits of various perfusing solutions at various temperatures are being evaluated.

Activities Outside the Medical Center

Members of the department have continued their interests and activities in organizations related to anesthesiology and the associated sciences. More than 100 formal papers have been presented by members of the department at other institutions and meetings and thirty-seven scientific papers have been published during 1959. Among the special activities of members of the staff, has been the Fullbright Professorship awarded to Dr. B. Raymond Fink for teaching in Finland for two months. He performed a most useful task for the development of anesthesio-

ogy in Finland and at the University of Turku. Papers by Drs. Ngai and Nahas were presented at the 21st International Physiological Congress in Buenos Aires, Argentina. Their work was well received at this meeting of eminent scientists. Professor Papper had the privilege of visiting Leningrad and Moscow during the summer. He visited

several of the scientific institutes including the Pavlov Institute in Leningrad and also had the opportunity to observe the development of Soviet anesthesiology in the hospitals of Leningrad and Moscow. A most interesting experience was the opportunity to administer anesthesia in Moscow at the request of Russian surgeons.

Biochemistry

DAVID RITTENBERG, *Professor and Chairman of the Department*

Instruction in biochemistry has been given to the first year medical and dental classes and to forty-nine students under the graduate faculties. Of the latter, thirty-four had their major interest in biochemistry, fifteen in other departments of the University. In addition, twenty-two post-doctoral fellows are receiving training in the department. This latter aspect of the teaching function of the department is rapidly increasing in scope.

All the members of the department have an active research program. Support has largely come from outside sources. The volume of research support has now exceeded the physical absorptive capacity of the department; increase of research will now result in a diminution of teaching.

Professor David Rittenberg has carried on investigations on the rate of protein synthesis in bacteria and on the properties of the enzyme, hydrogenase. He has been assisted in this by two visiting scholars, Dr. Emanuel Riklis of Israel and Dr. Ljerka Purec of Yugoslavia.

Professor Erwin Chargaff has continued his investigations on the chemistry of the nucleic acids and their relation to cell differentiation. He has been assisted by Drs. George Brawerman, Fred Goodman, Jack Horowitz, Abraham Rosenberg and Herman S. Shapiro. In addition, four visiting scholars carried on their investigations. They were Dr. Jussi J. Saukkonen of Finland, Dr. Eiji Okuhara of Japan, Dr. Angel O. Pogo of Argentina and Dr. John H. Spencer of Canada.

The biochemistry laboratory at the Francis Delafield Hospital under the direction of Professor Samuel Graff has continued research on the biochemical characteristics of cancer and the environmental and hormonal influences on metabolic events in isolated cells as well as intact animals. Professor Graff has been assisted by Professors Horace B. Gillespie, Max A. Eisenberg, Aaron Freedman, and Kathe M. Liedke and Mrs. Ada M. Graff.

Professor Maxwell Karshan continued his

studies on the amylase activity and chloride content of saliva in relation to dental caries and continued in charge of the course in biochemistry given to the dental students.

Professor Alvin I. Krasna has continued his studies on the mechanism of the aspartase reaction. He has synthesized fluoromalic acid and investigated its reactions in various enzyme systems. The inhibition of the enzyme hydrogenase by carbon monoxide and its reversal by light were investigated. He has also begun to study the role of the enzyme hydrogenase in hydrogen photosynthesis.

Professor Barbara W. Low and her associates, Drs. Wolfie Traub, Herman C. Watson and J. Ralph Einstein, continued their X-ray crystal structure study of the stereochemistry of the insulin molecule.

Professor Stanley L. Miller has been studying the formation of amino acids on the primitive earth. It has been shown that amino acids can be formed in good yield by the action of an electric discharge on a mixture of methane, ammonia, hydrogen, and water. The atmosphere of the primitive earth may be composed of this mixture of gases. Experiments are being conducted to find conditions under which purines and pyrimidine might have been synthesized on the primitive earth, and in the course of these studies several ultra violet compounds have been found. He has also been studying the permeability of the cornea to water and calcium *in vitro*, and this is being done in collaboration with Dr. Anthon Donn, Assistant in Ophthalmology and Assistant Ophthalmologist.

The laboratory of Professor David Shemin has been engaged in several research programs. In collaboration with Professor Goro Kikuchi and Dr. Frances Baker, enzymes concerned with the synthesis of δ -aminolevulinic acid and phosphobilinogen, were isolated and purified. In collaboration with Mr. Richard Bray, he has studied the biosynthesis of vitamin B₁₂ and with Miss Tessa Abramsky, he has studied the effect

environmental conditions on the formation of enzymes concerned in porphyrin synthesis. The laboratory is also studying the function of vitamin B₁₂ with Dr. Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist, and the mechanism of enzyme repression with Professor Keizo Tsushima, visiting scholar from the Nippon Medical School. Professor David Hemm spent this past academic year at the Institut Pasteur in Paris in the department of Dr. André Lwoff, working on aspects of lysogenic phage.

Professor David B. Sprinson, Professor of Biochemistry, and his colleagues have studied the biosynthesis of the aromatic amino acids in bacteria; the chemical synthesis of intermediates in the aromatic pathway; the chemical synthesis of polycyclic acid intermediates in one-carbon metabolism; the oxidation of ethanolamine in animal tissues and the metabolism of β -aminoisobutyric acid in human subjects. Collaborating with him were Drs. Irving J. Borowitz, Mary J. Clark, Mary Chalmers, Muriel Sackler, Judith G. Levin, and Norma Bernhardt.

Professor Parithyachari Srinivasan has been investigating the biosynthesis of anthranilic acid and α -aminobenzoic acid. Anthranilic acid, an intermediate in the biosynthesis of tryptophan, was shown to be derived from shikimic acid-5-phosphate and L-glutamine in enzymatic extracts of *Escherichia coli*. The conversion was found to require DPN⁺. The amino group of anthranilic acid is derived from the amide N of glutamine. 3-Aza-L-serine and 6-diazo-5-oxo-L-norleucine, well-known inhibitors of purine biosynthesis, were found to inhibit the formation of anthranilic acid, thus establishing a new locus of action by these glutamine analogues. *p*-Aminobenzoic acid was also found to arise from shikimic acid-5-phosphate and L-glutamine in enzymatic extracts of

baker's yeast. Studies are in progress to establish the cofactor requirements in the two systems and the nature of intermediates involved in these reactions.

Professor Stephen Zamenhof, in collaboration with Dr. Sheldon Greer and Dr. Erela Ephrati-Elizur, has conducted studies on incorporation of 5-bromouracil into deoxyribonucleic acid, and on biochemical and mutagenic effects of deuterium oxide and heat.

Dr. Gerald B. Phillips has been studying the individual phospholipids of human serum and serum lipoprotein fractions in normal subjects and in patients with hyperlipemia. Similar studies are being done on normal and abnormal human red blood cells.

Professor Ernst Bergmann was a visiting Professor in this department during February - May, 1959. He lectured on the chemistry of fluoro compounds and on sterol metabolism in insects.

The departmental seminars were addressed by distinguished visitors, including Sir Hans Krebs (Oxford), Luis F. Leloir (Buenos Aires), A. Rafter (Atomic Energy Commission, New Zealand), D. E. Green (Wisconsin), R. R. Porter (National Institute for Medical Research, London), Harmon Craig (La Jolla, California), M. Brenner (Basel), N. Kaplan (Brandeis University), T. S. Work (National Institute for Medical Research, London), and George Wald (Harvard).

Acknowledgment

The activities of the department were supported by grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, the Office of Naval Research, the National Science Foundation, the National Institutes of Health of the United States Public Health Service and the Rockefeller Foundation.

Dental and Oral Surgery

GILBERT P. SMITH, *Professor and Chairman of the Department
Director of Service*

The past academic year was an unusual one for the School of Dental and Oral Surgery because of the action taken by the Trustees of the University in establishing a separate Faculty of Dental and Oral Surgery. This move has been received enthusiastically by the dental faculty, the dental students, dental educators, the Association of Dental Alumni and the dental profession throughout the country. The hope of all is that it will permit and stimulate the growth and development of the School.

The activities of the School have continued much as in the past, the major effort having been toward conducting the course in dentistry leading to the degree of Doctor of Dental Surgery, the courses for dental hygienists and the postgraduate courses in dentistry. The dental clinic has operated smoothly providing a field for clinical training in the teaching programs mentioned and dental service to the Medical Center and the public. Considerable research has been conducted and the staff has been active in writing and participation in professional affairs.

The teaching program in the Department of Dental and Oral Surgery has been continued on the same high level by a devoted and hard-working staff. The teacher-student ratio in most areas has been favorable and permits the close supervision necessary in developing the skills and the understanding required in the technical and clinical phases of dentistry. In general, an effort has been made to keep course content abreast of modern developments. Improved techniques have been adopted; use of newer drugs, materials and instruments has been introduced wherever possible; the results of recent research in the basic science areas have been included, and efforts to stimulate student interest in investigative procedures have been stressed.

During the year, the staff of the Department has contributed materially to dental activities outside the confines of the Medical Center. They have presented 160 lectures and forty-two clinics

before dental organizations, locally and within the State of New York. Sixty-five lectures have been given elsewhere in the United States and eight staff members lectured in foreign countries. Professor T. Mitchell Bundrant addressed dental meetings in Puerto Rico and Japan. Professors Harold Sherman, Joseph M. Leavitt and Francis J. Loughlin gave lectures before the Pan-American Dental Congress in Mexico City. Professor Harry A. Galton delivered a series of lectures at the University of Tokyo. Professor Alvin S. Nathan spoke before the Port-Au-Prince, Haiti, Dental Society and Professor Max A. Pleasure lectured to classes in the dental schools of Paris, Rome and Jerusalem. Professor George W. Hindels was a principal lecturer at the Fifteenth Australian Dental Congress at Adelaide, South Australia. While in the Orient, Dr. Hindels delivered lectures to the staff and student bodies of Nihon and Osaka Universities' dental colleges in Japan and the University of Bangkok Dental College in Thailand.

A number of staff members successfully passed examinations of dental specialty boards during the year. Drs. Louis J. Loscalzo, Louis Mandel and Seymour Zeff became diplomates of the American Board of Oral Surgery; Dr. Bert B. Schoeneman became a diplomate of the American Board of Orthodontics; Professors Sebastian A. Bruno, William C. Hudson, Jr. and Gilbert P. Smith became diplomates of the American Board of Prosthodontics and Dr. Charles Berman and Professor Irving B. Stern became diplomates of the American Board of Periodontology. Dr. Smith was elected a member of the American Board of Prosthodontics. Professors Edward A. Cain, Jr., Robert E. Herlands, John J. Lucca and Harold Sherman were elected Fellows of the American College of Dentists.

In the several divisions of the School there have been innovations and improvements. In the Orthodontics Division, under the direction of Professor Nicholas A. Di Salvo, a clinical fellow-

ship program has been inaugurated whereby a selected group of graduates from the certificate course have continued on in the Division where they help in the clinical teaching program. This has additional advantages in that the recent graduates expedite the transition of treatment of patients from their class to the next and they become a source of future staff members.

Another development is the introduction of a system of closer control of the progress of treatment for clinic patients in the Orthodontic Clinic. This should result in more efficient operation of the clinic and completion of treatment in a shorter period.

In the Pedodontic Division, under the direction of Professor and Attending Dental Surgeon Solomon N. Rosenstein, the cerebral palsy program was broadened significantly. A new two-chair clinic for this activity has been equipped in memory of the late Saul A. Shlakman by his friends. Installation expense was met by the United Cerebral Palsy Association of New York City. This facility will be used in the treatment of handicapped children and in the special training required for dentists in serving these patients.

In the Division of Stomatology, under the direction of Professor and Attending Dental Surgeon Edward V. Zegarelli, an intensified program of clinical research in all phases of oral medicine and disease has been in progress. In conjunction with Dr. Paul A. di Sant'Agnese, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, and Dr. Carolyn R. Denning, Assistant in Pediatrics and Assistant Pediatrician, a study is being made of pigmentation commonly found in deciduous teeth of patients with cystic fibrosis of the pancreas. With Dr. Stuart W. Cosgriff, Assistant Professor of Clinical Medicine and Assistant Attending Physician, a study is being made of the relation of dental operative procedures to the onset of serum hepatitis. The study on the relation of salivary composition to oral disease and the histochemistry of salivary calculus conducted by Professor Irwin D. Mandel is continuing. In collaboration with Dr. Rosalyn Barbash, Assistant Physician in the Allergy Clinic, Professors Austin H. Hutscher and Edward V. Zegarelli studied the results of intradermal testing of patients having recurrent ulcerative stomatitis. Dr. Kenneth C. Deesen and

Professor Kutscher conducted a study of the efficacy of macrophotography in oral disease. In another study, Dr. Zegarelli demonstrated triamcinalone acetonide to be an effective suppressant for recurrent ulcerative stomatitis.

The Dental Service for Presbyterian Hospital is provided by the School of Dental and Oral Surgery and has been under the supervision of Professor and Attending Dental Surgeon William J. Savoy, as Director. During the year, 41 percent of the 6,476 patients treated in the School dental clinic were referred by physicians from the Hospital. Of the 60,002 patient visits to the clinic, 24,347 were made by Hospital patients. These figures indicate to some extent, but do not give a complete picture of the dental service required by Hospital patients. Because much of the dental service is rendered by undergraduate students, and because the School does not have adequate facilities or staff, there are many patients who do not receive all of the dental care that they need. These people usually present problems that are beyond the capacity of undergraduate students whose skills and abilities are limited. More experienced operators and enlarged facilities are required to solve these dental problems which are of such vital importance in restoring the health of these patients.

Looking to the future, the problems confronting the Dental School are many. The physical plant, the staff, the student body, the educational programs, the research activities, the association with other units of the Medical Center and financial support need consideration. The present quarters of the School of Dental and Oral Surgery are inadequate and require modernization. They occupy space that was not designed for the needs of a dental school and have proved to be inefficient to operate. All areas of activity are crowded, and some needed facilities are entirely lacking. Room for research, for staff offices and for conducting postgraduate courses is particularly meagre. The solution to this problem is the acquisition of new and enlarged quarters.

The dental staff wishes to acknowledge the generous contributions of many friends and organizations who have assisted us during the year. We are extremely grateful to the Association of Dental Alumni, the Newtown Players, the United Cerebral Palsy Association, United Cerebral Palsy

of New York City, Incorporated; E. R. Squibb and Sons, Bristol-Myers Company, the Dome Chemical Corporation, the United States Public

Health Service, the Edward Bernays Foundation and to the many individuals who wish to remain anonymous.

Dermatology

CARL T. NELSON, *Professor and Chairman of the Department
Director of Service*

The dermatological ward and treatment facilities completed four years ago in Presbyterian Hospital continued to serve the department well during 1959. In the face of near-capacity utilization, the staff has been able to render improved dermatological inpatient care and has found the unit to be an effective aid in the teaching of medical students and in the training of house officers and nurses. Unfortunately, this cannot be said for the outpatient quarters occupied at the present time by the department in Vanderbilt Clinic. Although ambulatory patients undeniably continue to receive adequate care, the structural arrangement of the clinic (designed for an era when syphilis was treated with heavy metals) imposes a number of inefficiencies in its operation. More important than this, however, is the lack of suitable space in the clinic for the instruction of medical students. Training as a clinical clerk on an outpatient basis requires that sufficient separate rooms be provided to enable the students to examine and question patients in private. Until such examination rooms become available, the facilities for outpatient instruction of medical students in dermatology must be considered as less than satisfactory.

During 1959, outpatient visits to Dermatology in Vanderbilt Clinic totaled 31,998 and there were 110 admissions to the dermatological ward in Presbyterian Hospital. In addition, 833 patients were treated in consultation with other services. The serological research laboratory performed 912 treponemal immobilization tests for patients admitted to various services of the Medical Center and the mycology laboratory examined 3,844 specimens. The rise in the demand for specialized mycologic examinations for deep fungi continued during 1959 and again severely taxed the facilities of this laboratory.

The undergraduate curriculum and graduate training program for residents and fellows underwent no major changes during the past year. With the retirement of Professor Paul Gross, Profes-

sor Beatrice M. Kesten assumed direction of the special lectures and seminars held each week for the residents and fellows.

As in previous years, a large number of physicians from this country and abroad were guests of the department and participated in its educational activities. Visitors from other countries included Professor Yoshisada Takahashi, Tohoku University, Sendai, Japan; Dr. Isadore Pasmanik, University of Chile; Professor Luis E. Pierini and Dr. David Grinspan, University of Buenos Aires; Dr. Sharat C. Desai, University of Bombay; Dr. Mary Ridley, Queensland Institute for Medical Research, Brisbane, Australia; Professor Rene Morquer, University of Toulouse, France; Dr. A. L. vanBeverwijk, Baarn, Netherlands and Dr. Peter Austwick, Weybridge, Surrey, England.

Staff Changes

The tragic and unexpected death of Dr. Gerald F. Machacek, Associate Clinical Professor and Attending Dermatologist, in his sixty-second year on November 8, 1959, was a grievous loss to the department and to the Medical Center. Dr. Machacek had been in charge of the dermatological pathology laboratory for more than thirty years and had achieved a position of high distinction in his specialty. Kindly and generous, his knowledge not only of dermatopathology but also of other fields was a source of inspiration over the years to younger trainees and associates alike.

During the year, Dr. Paul Gross, Clinical Professor of Dermatology and Attending Dermatologist and a member of the staff since 1924, retired and was appointed Consultant Dermatologist. Fortunately, we shall continue to have the benefit of the services of this wise counsellor and excellent teacher. Dr. James E. Ridgway, Instructor in Dermatology and Attending Dermatologist in Vanderbilt Clinic, also reached retirement age during the year. Dr. Ridgway has given many years of loyal and effective service to the

Medical Center and has won the respect and gratitude of the entire staff. Promotions effective July 1, 1959, are those of Drs. Benjamin J. Chester as Associate in Dermatology and Leo Schweich to the rank of Associate in Dermatology and Attending Dermatologist.

Other changes in the staff during 1959, include the appointment of Dr. Arturo L. Carrion as Lecturer and Drs. Edward W. Jewell and Herbert L. Kraut as Assistants in Dermatology. Drs. Jewell and Kraut were formerly Visiting Fellows in Dermatology and Dr. Carrion returns to the department after an absence of several years. It is with pleasure that we record the appointment of Dr. Gerd K. Steigleder as Assistant Professor of Dermatology on a full-time basis. Dr. Steigleder comes to us from the University of Frankfurt where he attained distinction as a dermal histopathologist. His studies on the behavior of enzymes of the skin surface under normal and abnormal conditions have attracted wide attention. It is gratifying that facilities and funds have been made available for him to continue his research here. Dr. Steigleder will also be actively engaged in teaching. He has assumed the important responsibility of graduate teaching in dermal histopathology. He is also in charge of the dermatological pathology laboratory.

Research Studies

As in previous years, the research activities of the staff utilized the clinical facilities in Presbyterian Hospital and Vanderbilt Clinic, as well as the laboratories of the College of Physicians and Surgeons. Dr. Leslie P. Barker continued his studies of the histochemical variations in normal fetal and infant skin. This work again was carried out in collaboration with the Department of Pathology of the Medical Center and at St. Luke's Hospital. Dr. Marvin Brodey, with Dr. Saul L. Sanders and Professor Nelson, completed a ten-year follow-up study of fifty patients with pemphigus who have been treated with corticosteroids at the Medical Center. The results of this unique long-time study are now being prepared for publication.

Professor Helen O. Curth and Mr. I. Lester Firschein made further observations on the relation of acanthosis nigricans to visceral cancer. This work has been supported by a grant from

the National Institutes of Health. Dr. Curth, with Dr. Eli S. Goldensohn, Assistant Professor of Neurology and Associate Attending Neurologist, has undertaken a study of the association of disorders of the central nervous system with those of the skin. Dr. Bohdan E. Dobias continued his investigation of the effects of a cell extract prepared from *C. albicans* on transplantable tumors in mice. Dr. F. Philip Lowenfish investigated further the local therapeutic effect of combinations of corticosteroid and anti-fungal agents in superficial fungus infections of the skin. Prior to his untimely death, Dr. Machacek, with Dr. David R. Weakley, completed a study of the histologic relationships of giant condyloma acuminata to squamous cell carcinoma.

Professor J. Lowry Miller has initiated a study of the abnormal globulins found in the blood of individuals with persistent biologically false positive reactions to the standard serologic tests for syphilis. It is possible that further data on the qualitative and/or quantitative differences in these globulins may ultimately permit the clinician to distinguish these patients in whom the false positive reaction is of serious prognostic significance from those in whom it is of little concern. Dr. Miller also completed an investigation of the comparative reliability of the Reiter protein complement fixation test and the more complicated *T. pallidum* immobilization reaction in the serologic diagnosis of syphilis. Although the Reiter test appears to be a sensitive one, additional studies will be needed to establish fully its utility and limitations.

Dr. Leo Schweich and Dr. Paul G. Meyer made additional observations on the therapeutic efficacy of combinations of anti-malarial drugs in chronic discoid lupus erythematosus. In connection with this study, Drs. John E. Hannibal, Jr. and Frank R. Nataro investigated the occurrence of cold-precipitable globulins in the blood of patients with chronic discoid lupus. It has been reported that cryoglobulins are frequently found in these patients, but the results of these studies do not confirm such findings.

Professor Margarita Silva and Miss Helen Buckley, continuing their fundamental studies on the nutritional requirements of fungi, have found that certain protein fractions of eggwhite exert a pronounced inhibitory effect on the growth of

dermatophytes and systemic fungal pathogens. Apparently, this broad-spectrum antifungal activity is not due to avidin or lysozyme. Studies have been undertaken to identify the substance and to explore its possible application to therapy. Dr. Silva, with Mr. J. Dennis Pollack, also studied the effect of amino acids on the growth of pleomorphic isolates of *E. floccosum*. In collaboration with Mrs. Irene Weitzman, Dr. Silva recently initiated an investigation to determine whether the sexual and/or parasexual methods of genetic recombination, found in other imperfect fungi, exist in dermatophytes.

Dr. Sanders and Dr. Silva, with Dr. Angel Trinchán-Plou, continued the study of the role of hypersensitiveness in clinical dermatophytic infections. In conjunction with this work, a large-scale investigation of the therapeutic value of the new antifungal agent, griseofulvin, has also been undertaken. After nearly a year of study, it is apparent that griseofulvin is effective in the treatment of tinea of the scalp and glabrous skin. The results in dermatophytosis of the nails, hands and feet, however, leave much to be desired. The findings of this study are now in preparation for publication. Dr. Elizabeth Hazen, full-time guest investigator in the division of mycology, continued her studies of the role of various vitamins and minerals in the production of macroconidia in *M. audouini*.

Dr. Steigleder initiated a study of the histochemistry of keratinization in Darier's disease. This work has already yielded new information about keratin formation not only in this disease but also in normal skin. Dr. Steigleder and Dr. Weakley investigated the vesiculating activity of lithium bromide on skin and showed that the epidermal changes induced by this agent are fundamentally different from those seen in true acantholysis. Dr. Steigleder also continued his studies of the behavior of enzymes on the skin surface and recently developed a new method for the direct demonstration of non-specific esterases and acid phosphatases.

Staff Activities

During the past year, members of the staff were

elected to various offices and lectured before a large number of scientific assemblies in this country and abroad. Professor George C. Andrews delivered a series of lectures under the auspices of dermatological societies in Venezuela and Argentina. Dr. Barker served as Chairman of the Section on Dermatology and Syphilology of the New York Academy of Medicine and also was elected Secretary of the New York Dermatological Society. Dr. Helen Curth addressed the annual meeting of the American Society of Human Genetics in University Park, Pennsylvania. Dr. Domonkos again was Chairman of the Panel on Dermatologic Photography at the annual meeting of the American Academy of Dermatology and Syphilology. Dr. Gross participated in the Congress of the Italian Dermatological Association in Pavia, Italy. Dr. Kesten continued to serve as Secretary of the American Board of Dermatology and also was elected Secretary of the Section on Dermatology and Syphilology of the New York Academy of Medicine. Dr. Miller addressed the tenth annual symposium on Recent Advances in the Study of Venereal Diseases, held in Baltimore. Dr. Nelson acted as Visiting Professor at the University of North Carolina for one week in April. He also was appointed a member of the Committee on Sarcoidosis of the National Academy of Sciences. Dr. Silva addressed the Ninth International Botanical Congress in Montreal and Dr. Steigleder served as an editor of the new *Handbuch der Dermatologie*.

Acknowledgment

The staff gratefully acknowledges the support given its research program during 1959 by the following: Alfred P. Sloan Foundation, Duke Laboratories, Inc.; Lehn and Fink Products Corporation; The Fund for Research, Inc.; Merck, Sharp and Dohme Research Laboratories; Schering Corporation; The Cole Foundation; Winthrop Laboratories and an individual donor who wishes to remain anonymous. The National Institutes of Health, through several agents, also contributed greatly to the support of this department's research activities.

Medical Library

THOMAS P. FLEMING, *Professor of Library Service*

The alleviation of our problem of lebensraum is still a cope to be repeated wistfully. Additional portions of the collection were removed and sent to our two principal annexes, South Property at 165th Street and Riverside Drive, and the Butler Library at 114th Street and Broadway. In our periodical room, we try to keep the unbound issues and the preceding complete volumes for roughly a ten year span. With the increase in the number of journals received, as well as a stepped up publication rate on the part of well established journals, we found our space to be inadequate. It was decided to remove all the foreign language journals dated 1950-55 and to shelve these in the Main Stacks. This involved the removal of some 8,700 volumes, representing 1,400 titles. In order to do this, a like or greater amount had to be removed from the Main Stacks and sent to Butler, where we already have serial publications dated before 1900. This year we pulled out entire sets of journals which had ceased publication before 1950 and which, in our opinion, could be considered "lesser used." In all we sent some 12,000 volumes to Butler. The number of volumes stored in Butler, which had to be returned for use by readers, rose fifty-seven per cent over that of the previous year. The daily messenger service had frequently to be augmented by the use of taxis and in several instances trucks. In all some 1,500 volumes were brought back and then returned.

In order to gain additional living space, we sent our entire Memorabilia Collection numbering some 3,000 volumes to the fifteenth floor of Butler, and we also sent some 100 oversized monographs to our annex in South Property.

The personnel complement of our catalog department has remained substantially the same for the past fifteen years. During this time, the quantity of publications flowing into the library has been markedly increased. As a consequence, cataloging activities are far from up to date. In an effort to cut corners, some 3,000 items have been "deferred." Our possession of them is in-

dictated by a single card in the public catalog. Someday, hopefully, these publications will be fully cataloged. They are available to readers but since they do represent a special category, the entire collection was shifted to the fifteenth floor of Butler Library.

The overflow from the Webster Library of Plastic Surgery housed in Office B was likewise shifted to Butler Library and, in its place, was put our rapidly expanding audio-visual collection.

The cut-off date of certain indexing and abstracting services shelved in the Main Reading Room was moved up from 1946 to 1950, necessitating the shift of over 100 volumes to the separate bibliographic section of the Main Stacks.

Together with a special committee, our entire Chemistry collection was weeded. Over 100 texts and monographs were withdrawn and portions of certain journals were shipped to Butler Library. The Chemistry Reading Room was reorganized. Portions of certain journals were shifted to the Chemistry Stacks and additional titles brought into the Chemistry Reading Room. This is one example of closer liaison with the departments for the selection and maintenance of the collection.

Our collection has grown to 230,000 volumes with more than 3,100 journals being received currently. Beginning in January, 1959, we changed the length of our loan period from one week to two weeks. It seems to have made little effect on the percentage of publications returned on time.

The use of our library continues to grow. More than 228,000 volumes were utilized during 1958-59 in contrast to 202,000 the year before. This represents an increase of almost 13 per cent. In the period July to December, 1959, the increase was roughly ten per cent.

Orientation in the use of the library was given to some 350 entering students in the various schools and programs of the Medical Center. These orientation lecture tours coupled with formal lectures to specialized groups represent an

expansion of this activity over the year before, but still falls far short of presenting this information to all newcomers to the Center. The change in curriculum for the first year medical students affected the library in that biochemistry was studied before anatomy and involved for the first time, the preparation of a term report. The formal lecture on the use of the literature previously had been given as part of the course in anatomy. As a consequence, many of the biochemistry students were ill-prepared to write their term paper. Emergency instruction was given to small groups. In the second year of the new program, a closer liaison with the departments of instruction has avoided a similar occurrence.

Further restrictions were placed on our interlibrary loans to the more than one hundred local libraries which borrow from us. We compiled a special list of 150 periodicals which we will neither lend, photostat, nor microfilm. Despite these restrictions, our interlibrary loans remained approximately the same. More than 1,100 volumes were loaned to some 143 different libraries. A special study of interlibrary loan procedures was conducted in order to answer a number of questions concerning borrowers, the type of literature borrowed, as well as the subject matter dealt with. The results of the study will be published in 1960.

Special exhibits were installed in conjunction with meetings of the Columbia-Presbyterian Medical History Society, in conjunction with Alumni Day and the 50th Anniversary of the Neurological Institute. Lack of adequate exhibit space is a source of sorrow for us, for we have much to show and no facilities with which to do so.

Our library continued to be visited by librarians and scientists throughout the world. Last year, visitors from eleven foreign countries spent varying periods of time with us. The International Conference on Scientific Information, attended by the Librarian, was held in Washington, D. C. in November, 1958. As a result, an unusually large number of visitors came to this library, particularly from Poland, Russia, and Brazil. Librarians of Medical Schools from Haiti, Japan, Argentina, and Lebanon studying in the School of Library Service, used our library to gain "in service training" for periods varying from two weeks to six months. The library also served as

the laboratory for the special courses in medical librarianship given by the Librarian under the auspices of the School of Library Service.

The Bibliographic Service continues its important function of supplying references to the literature on subjects under investigation. More than 12,000 references were supplied on thirty-eight subjects of which twenty were new during the period July, 1958-December, 1959.

Over 17,000 information and reference questions were answered by members of the Reference Department. Our services were officially acknowledged by the authors of four monographs published this past year.

Mr. Harold Bloomquist, Medical Reference Librarian, resigned to take the position of Assistant Librarian of the Harvard University Medical Center and was succeeded by Miss Eva H. Eckert. Miroslav Labunka was appointed Senior Reference Assistant, Robert M. Montgomery and Samuel J. Waddell were appointed Reference Assistants. The professional members of the staff continued their activities in various professional organizations. Cecile E. Kramer, Reference Assistant, served as Secretary of the New York Regional Group of the Medical Library Association. Professor Fleming was elected a member of the Executive Board of the New York Regional Group of the Medical Library Association and elected a member of the Advisory Council of the Renaissance Society of America; served as a consultant to the American Library Association on the reprinting of medical publications and presented a report to the Medical Library Association at its convention in Toronto on reprinting. He also presented a paper before the American Association of Law Librarians on the "Certification of Medical Librarians." He served as a member of the Publications Committee of the Columbia University Press, served as an Observer at the International Conference on Scientific Information in Washington, D. C.; he also prepared a report for the American Medical Association on its bibliographic activities.

It has been pointed out in previous reports, that the excellence of our resources is dependent upon the continued gifts from all our clientele, alumni and friends. While it is not possible to enumerate all those who have contributed publications and monies, some of the outstanding

gifts were made by Dr. Jerome P. Webster who continued his past generosity by contributing funds for the purchase of publications in the field of plastic surgery. Money gifts for the purchase of books were received from Dr. Walter S. Root in honor of Dr. Jerome P. Webster and from Dr. and Mrs. M. J. Schwartz in honor of Dr. Robert Chabot. Mr. Emil Oberholzer, Jr. presented the

professional library of his late father, Dr. Emil Oberholzer, consisting of 588 serials and 728 monographs, and Mrs. Israel Horowitz presented the library of her late husband, Dr. Israel Horowitz, Class of 1903. Included in the library, were Dr. Horowitz's notebooks on lectures which present an interesting sidelight on medicine as taught some sixty years ago.

Medicine

STANLEY E. BRADLEY, *Professor and Chairman of the Department
Director of Service*

For nearly fifty years, the Medical Service of the Presbyterian Hospital and the Department of Medicine in the College of Physicians and Surgeons of Columbia University have worked in close association to foster and maintain the highest standards of medical practice and scholarship. This union has created a stimulating setting within which students, house officers, and attending staff have grown in understanding and skills. In a large measure, the balanced coordination of full-time and part-time workers, that has contributed so importantly in developing clinical investigation and in improving clinical teaching techniques, is to be attributed to the wisdom of the Chairmen of the Department and Directors of the Medical Service during the last generation, to Professors Walter W. Palmer and Robert F. Loeb. Under their guidance the department has grown in effectiveness not only at Presbyterian Hospital but also at Bellevue Hospital, Goldwater Memorial Hospital, and Francis Delafield Hospital.

When Professor Loeb took up the Directorship on July 1, 1947, he found that the Department of Medicine reflected Professor Palmer's "spirit of kindness, his understanding, his self-effacement, and sound judgment." In his turn, Professor Loeb has conserved all of the best in the Department created by Professor Palmer and has contributed his own inimitable critique and illumination. Professor Loeb went on leave of absence on June 30, 1959, preparatory to final retirement on June 30, 1960. He will continue as Consultant in Medicine at the Hospital and Bard Professor Emeritus of Medicine in the College. It is to be hoped that the Department of Medicine will continue to be enlivened by his presence and advice. Professor Loeb has always stood in the forefront of the battle to maintain excellence in education, patient care, and research. His courageous and spirited resistance to the forces that encroach upon and threaten these ideals has conferred upon the Department of Medicine an extraordinary prestige and has won the allegiance

of a dedicated and richly endowed staff in whose hands the future of the department is assured.

Staff Changes

On November 22, 1959, the department lost by death one of its most distinguished and devoted members, Dr. Albert A. Lamb, Professor Emeritus of Clinical Medicine and a Consultant in Medicine. His service to the School and Hospital extended over a period of some forty-five years, from his graduation from the College of Physicians and Surgeons in 1907 to retirement from active practice in 1952. Nor did it end there, for in his later years he wrote a history of the Presbyterian Hospital that eloquently describes the exciting period in which the concept of the Medical Center first grew up. Professor Lamb played an essential role in making the idea a reality and, by his energy, self sacrifice and thoughtfulness, in helping it to flourish. The death of Dr. George Draper, who was Associate Professor of Clinical Medicine and Associate Attending Physician when he retired in 1946, is also reported with profound regret. Professor Draper will be long remembered in the department for his insistence upon the need for a lively appreciation of all aspects of the total individual. His recognition of what he was the first to call "psychosomatic medicine," his keen awareness of the complexities of disease and his contempt for sham made him a stimulating and outstanding teacher. We are also sorry to record the deaths of Dr. Robert Muller, Instructor in Medicine and Assistant Attending Physician, and Dr. Frank D. Rossomondo, Associate in Medicine and Associate Visiting Physician at Bellevue Hospital.

Professor Richard J. Cross resigned in June to assume the duties of Associate Dean at the University of Pittsburgh School of Medicine. Dr. Julian I. Kitay became Assistant Professor of Medicine at the University of Virginia in July. Professor Calvin H. Plimpton, having completed two years as Professor of Medicine at the Ameri-

can University of Beirut, Lebanon has returned to assume his academic activities at Columbia. He has been appointed an Assistant Dean and has returned to full activity in the department. Professor Paul B. Sheldon retired on June 30, 1959, after a long career as a stimulating teacher and devoted clinician. Professor Quentin B. Deming has resigned from the staff to assume the duties of Associate Professor of Medicine and Director of the Unit for Research in Aging at the Albert Einstein College of Medicine, and Dr. Marie M. Daly has accepted a position as Assistant Professor of Biochemistry at the same institution.

Honors

A number of unusual distinctions have come to members of the department during the past year. Professor Loeb was reappointed to the National Science Board by the President and also was appointed by the President to his Science Advisory Committee. He became a member of the Advisory Committee for Biology and Medicine of the Atomic Energy Commission, and became the first recipient of the Treadwell Award of the Massachusetts General Hospital and served there as the first James Howard Means Visiting Physician. He has been made a member of the International Advisory Committee on Medical Research of the World Health Organization and was made a Master of the American College of Physicians. He was awarded the Kober Medal of the Association of American Physicians. Professor Emeritus Dana W. Atchley received the degree of Doctor of Science from Columbia University. Professor André Cournand received honorary degrees from the University of Lyons and the University of Brussels. He lectured at the University of Leiden and in Brussels and Paris. He was also elected President of the Harvey Society. Professor Cournand retires this year from the Chairmanship of the Cardiovascular Study Section of the United States Public Health Service after many years' service in this capacity. Professor Dickinson W. Richards was elected Councilor of the Association of American Physicians. He was appointed Chairman of the Scientific Advisory Council of the National Heart Institute and participated in the 10th Anniversary Symposium of the Ciba Foundation in London. He became a member of the Executive Committee of the

Health Research Council of New York. Professor Franklin M. Hanger served as a Visiting Professor at the University of Oregon.

Professor Karl Meyer received the T. Duckett Jones Memorial Award of the Helen Hay Whitney Foundation and the Pasteur Medal of the Pasteur Institute of Paris for his work on mucopolysaccharides. He also gave the Schonheimer Memorial Lecture of the Society of European Chemists. In addition, he lectured at the Symposium on Connective Tissue held in Munster, Germany and gave lectures in Stockholm, Uppsala, Leiden, Heidelberg, and Paris. He served as the annual guest lecturer of the Detroit Physiological Society. Professor Charles A. Ragan of this department with Dr. Harry M. Rose, John E. Borne, Professor in the Department of Microbiology and Attending Microbiologist, was awarded the Gairdner Foundation Annual Award for studies in rheumatoid arthritis. Dr. Ragan is a member of the National Council of the National Institute of Arthritis and Metabolic Diseases, Chairman of the Committee on Publications and a member of the Committee on Cooperative Clinics for Therapeutic Evaluation of the American Rheumatism Association, and he has served as a member of the Medical and Scientific Committee and of the Executive Committee of the Arthritis and Rheumatism Foundation. Dr. Ralph H. Boots served as a Director of the Arthritis and Rheumatism Foundation. Dr. Felix E. Demartini served as Secretary-Treasurer of the American Rheumatism Association.

Professor George A. Perera served as Chairman of the Written Examination Committee of the American Board of Internal Medicine and was elected to membership in the American Clinical and Climatological Association. Professor John V. Taggart delivered the Burrell O. Raulston Lecture at the University of Southern California and was named the first A. N. Richards Lecturer by the Physiological Society of Philadelphia. He continued to serve on the Council of the American Society for Clinical Investigation and on its Editorial Board. Professor Alfred Gellhorn addressed the International Society of Hematology at Rome and delivered numerous lectures throughout this country. He continued to serve on the Cancer Chemotherapy Committee of the National Institutes of Health. Professor

Stanley E. Bradley was elected to Fellowship in the American College of Physicians and delivered a Harvey Lecture.

Professor Joseph W. Jailer delivered the Aaron Brown Memorial Lecture at Boston University. He was appointed Chairman of the Cancer Chemotherapy Study Section of the National Institutes of Health. Professor Alfred P. Fishman served on the Editorial Board of the American Society for Clinical Investigation and was elected a Fellow of the American College of Physicians. Professor David Schachter delivered a lecture at the Graduate Fortnight of the New York Academy of Medicine. Professor William B. Sherman was made a member of the National Advisory Council on Allergy and Infectious Disease. He also addressed the International Congress of Allergology in Paris. Professor Charles A. Flood became a member of the Council of the American Gastroenterological Association. Professor Forrest E. Kendall was elected Chairman of the Council on Arteriosclerosis of the American Heart Association.

Professor John H. McClement served as Vice-President of the Eastern Section of the American Trudeau Society and Professor Julia M. Jones as Vice-President of the New York Tuberculosis and Health Association. Professor H. McLeod Riggins was elected President of the National Tuberculosis Association. Professor Harry W. Fritts was awarded a Guggenheim Fellowship for study in Sweden. Professors Fritts, Elliott F. Osserman, and Helen M. Ranney and Dr. Nicholas P. Christy were elected to membership in the American Society for Clinical Investigation. Professor Sidney C. Werner was elected to membership in the Association of American Physicians. Dr. Henry O. Heinemann was elected to the American Physiological Society.

Teaching and Research

In July of 1958, Miss Barbara E. Judkins was appointed Educational Director of the Social Service Department and Assistant Professor of Medical Social Work. In August, 1958, Miss Norma K. Fike was appointed Assistant Educational Director of the Social Service Department and Instructor in Medical Social Work.

The opportunity for learning and for service on the Medical Service and in the Vanderbilt

Clinic continues to be satisfactory in its variety, challenge and balance. During 1959, there were 5,468 admissions to the Medical Service and 1,049 to the Admitting Ward. The length of stay in the hospital averaged 14.8 days and the daily census averaged 220. More than 4,200 patients were admitted to the Group Clinic during the same period, 3,669 of whom were seen for the first time. The Group Clinic handled a total of 26,906 visits; Medical Outpatient, a total of 41,575. These numbers cannot indicate the varied patterns of illness with which the house staff and medical students may work. Nor do they reflect the human response, the daily drama of team work at all levels. The effort to bring varied disciplines and viewpoints together at the bedside to the mutual benefit of physicians and students has been continued. Arrangements have been made for rounds in association with the Psychiatric Service one day each week so that students and house staff on the two Services may profit by an exchange of views. In addition, daily rounds have been arranged in the Harkness Pavilion to foster a closer relationship between the attending staff and house officers in their management of private patients.

The department has again had the privilege of playing host to a number of Visiting Fellows and Trainees. More than fifty young men and women have worked in this capacity in the various units of the department during the past year. Fifteen came to us from England, France, Poland, Portugal, Italy, Israel, South Africa, Australia, Brazil, and Colombia for one to two years of training. Dr. Charles L. Christian was named John and Mary Markle Foundation Scholar during the year. Drs. Christy and Henry O. Wheeler continue to be supported as Markle Scholars. Fellowship support came from the American Cancer Society, American College of Physicians, American Heart Association, American Trudeau Society, Arthritis and Rheumatism Foundation, Banbury Foundation, Dazian Foundation, Department of Defense, Department of State, Eli Lilly Foundation, Hadassah Medical Organization, Kellogg Foundation, Lederle International, Life Insurance Medical Research Fund, The National Foundation, New York Heart Association, Public Health Service, Rockefeller Foundation and Rotary Foundation. Funds in support of

the investigative work came from numerous donors, including the Avalon Foundation, New York Tuberculosis and Health Association, Heart and Lung Foundation, in addition to those named above. Of particular importance has been the generous support by the many friends of the Medical Service whose gifts to the Daniel G. Arnstein, the Alice Weisl, and the Laboratory Development Funds have been extremely helpful.

Metabolism and Active Transport in the Kidney

The group of investigators working with Professor Taggart has continued its studies on metabolism and active transport in the kidney. In an attempt to learn more about the nature of the interaction of the transported compound and the cellular "carrier" in the renal secretory mechanism which is responsible for the excretion of various weak organic acids, several series of compounds have been synthesized for physiological studies. Dr. Thomas E. Morgan, Jr. has prepared a series of hippuric acids substituted on the benzene ring with one, two or three hydroxy groups in the various possible configurations. It was hoped that these compounds might be useful in revealing the importance of weak chemical forces, such as van der Waals, in the transport process. Dr. Alvin Essig has prepared a series of hippurates in which the benzene ring has been substituted in the ortho-, meta- or para-position with either amino, nitro, methyl, methoxy, fluoro, chloro, bromo or iodo groups. The tentative conclusions reached thus far are as follows: the transport of these compounds is not influenced by the electron-attracting or electron-repelling quality of the substituent group; when substitution is in the meta- or para-position, the rate of transport is directly related to the effective (or van der Waals) radius of the substituent group; when substitution is in the ortho-position, the radius of the substituent group has little effect on transport. Work with both of these series of compounds is continuing.

Calcium Metabolism and Transport in the Intestines

In the past year, Professor Schachter has continued studies on the mechanism of absorption of calcium in the small intestine. The absorption

was found to involve an active transfer mechanism, relatively specific for calcium and confined to the proximal small intestine of several mammalian species. With Dr. Eugene B. Dowdle, Visiting Fellow from the University of Capetown, South Africa the active transport of calcium was found to require vitamin D in the diet, or ultraviolet irradiation. Evidence was obtained that the active transfer is a facultative process, which ensures absorption of calcium in the young growing animal, in pregnancy, and in animals maintained on a low calcium diet. In the course of this work a sensitive, fluorimetric procedure for the estimation of magnesium was developed and used in determining concentrations in serum and urine. With Dr. Dowdle, an active absorptive mechanism for iron was demonstrated by experiments *in vitro* with the small intestine of the rat. This transfer process is considerably stimulated by ascorbate.

In collaboration with Dr. Daniel Nathans and Dr. Ralph Herz, Jr., Professor Donald F. Tapley has made a study of the active intestinal transport of certain analogues of thyroxine and of amino acids.

Studies of Thyroxine Metabolism and Thyroid Disease

Professor Tapley has also continued his investigation of the metabolism of thyroxine. In collaboration with Mr. William V. Shaw, a fourth year medical student, it has been shown that the ability of thyroxine to cause mitochondrial swelling is dependent upon the presence of the iodo-substituted diphenyl ether, but independent of the phenolic hydroxyl or the composition of the side chain. The disparity between these findings with various analogues *in vitro* and their known *in vivo* potencies prompted an investigation of the *in vivo* distribution of certain analogues. In collaboration with Dr. Wendell B. Hatfield, a Resident on the Medical Service, and Mr. Frank F. Davidoff, a fourth year medical student, a study was undertaken of the physiological disposition of certain analogues of thyroxine with altered side chains (e.g., the D-isomer, the acetic and propionic acid analogues).

Professor Werner has continued his studies on the abnormal pituitary-thyroid relation in Graves' disease. An effective assay system for the detec-

tion of circulating thyrotropin has been employed in the study of patients with hyperthyroidism. So far, only irregularly positive assays have been obtained. The highest thyrotropin titer was noted in a healthy control subject. In collaboration with Dr. Beatrice C. Seegal, Professor of Microbiology, and Dr. Robert W. Bates of the National Institutes of Health, neutralization of human pituitary thyrotropin and the thyrotropin material from a healthy subject and from a patient with thyrotoxicosis has been accomplished with an antiserum to beef pituitary thyrotropin. With Professor Seegal, the precipitin responses obtained with antisera prepared against beef pituitary thyrotropin of various degrees of purity have been investigated as well as the neutralization responses. The evidence suggests that a specific antibody to thyrotropin may have been produced. Immuno-electrophoretic studies are in progress with Professor Osserman of the Francis Delafield Hospital. Adaptation of these findings to the assay of circulating thyrotropin is proceeding. In studies made in collaboration with Drs. Richard J. Block and Richard H. Mandl of the Boyce Thompson Institute, Dr. Werner has observed a sharp discrepancy between the distribution of serum compounds in man after labelling with I^{131} and the stable I^{127} compounds. With Drs. Raul Grinberg and Eugene Volpert, studies of the effect of thyroxine analogues on responsive and non-responsive mouse pituitary tumors is being continued.

Dr. Henry Aranow is also continuing his studies of long-term antithyroid drug therapy in the management of thyrotoxicosis. Data obtained on more than 100 patients with ophthalmopathy treated by these agents suggest that this form of treatment carries a smaller risk of serious permanent eye damage than any other.

Endocrinological Studies

In collaboration with Drs. Donald A. Holub and Andrew G. Frantz, Professor Joseph W. Jailer has made studies of the effects of amphenone derivative (Su 4885) which selectively inhibits 11β -hydroxylation in the human adrenal gland. By administration of this compound to patients with congenital adrenal hyperplasia, the hypothesis previously advanced in favor of the notion that there is a relative lack of C-21 hy-

droxylation in the synthesis of hydrocortisone in this condition was confirmed. Dr. Leonard V. Fisher and Jack H. Oppenheimer have been exploring the role of the central nervous system in the control of anterior pituitary secretion. With the cooperation of the Neurosurgical Department, they have found that there is interference with the release of some of the pituitary tropic hormones in some patients with hypothalamic lesions. Dr. Holub and Dr. Joseph J. Barlow have improved the specificity of the method for assaying ACTH by utilizing the incorporation of tritiated progesterone into compound B in rat adrenal slices. Dr. Christopher Longcope is pursuing studies on the type of ACTH secreted in Cushing's syndrome. Dr. Andrew G. Frantz has devised several new chromatographic systems for the separation of corticosteroids and in collaboration with Dr. Fred H. Katz has found that 6β -hydroxyl-cortisol is an important urinary metabolite in man which had been previously overlooked.

Dr. Christy has continued studies of aspects of adrenal cortical physiology in man and animals. With Dr. Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist, he has carried out an extensive investigation of endocrine function in myotonia dystrophica. With Dr. Robert A. Fishman, Assistant Professor of Neurology and Assistant Attending Neurologist, Dr. Christy has continued an investigation of the passage of steroid hormones from blood into cerebrospinal fluid, and of the effect of prolonged induced hyper-adrenalism upon the blood-brain barrier. Detailed balance studies have been made in collaboration with Professor Paul A. Marks in two subjects receiving large doses of estrogenic substance for the treatment of neoplastic disease. It is planned to restudy this problem with Professor John H. Laragh, using a new method for aldosterone determination developed in the laboratory of Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology). With Dr. Frederick G. Hofmann, Assistant Professor of Pharmacology, Dr. Christy has studied steroid secretion *in vitro* by adrenal cortical tumors in mice. It has been possible to demonstrate by isotopic techniques that the tumors synthesize corticosteroids (G-21 compounds) though less efficiently than normal adrenal tissue. In dog, and

in man and cattle, it has been possible to demonstrate the presence in plasma of a substance which partially inhibits the hydrolysis of certain steroid glucuronosides by the enzyme, β -glucuronidase. Studies of the properties of this inhibitor are in progress. Preliminary studies undertaken in collaboration with Dr. William D. Drucker, Drs. Sam M. Beiser and Bernard F. Erlanger, Associate Professors of Microbiology, and Professor Seymour Liberman, Associate Professor of Biochemistry (Obstetrics and Gynecology) have so far failed to reveal the formation in man of a circulating antibody to these conjugates. With Dr. Drucker a study has been inaugurated upon the effect of estrogenic substances upon the detailed metabolism of certain corticosteroids. Finally, an investigation has been begun of possible anterior pituitary factors in the etiology of juvenile diabetes mellitus. A sensitive bio-assay method involving the detection of adrenal weight-maintaining activity is being employed as a possible index of excessive somatotropin in the blood of such patients.

Cardiorespiratory Laboratory

The members of the Cardiorespiratory Laboratory under the direction of Professor Fishman have continued their studies of the interrelations between the circulation and respiration in man. In September, the routine study of patients with congenital heart disease was transferred to the newly created Cardiovascular Diagnostic Laboratory in the Department of Pediatrics. The time made available is being used to further three studies: a long-term study of the effects of commissurotomy on patients with mitral stenosis, the natural history of cor pulmonale in patients with cystic fibrosis of the pancreas, and the natural history of chronic bronchitis in pulmonary emphysema. Dr. Sylvia P. Griffiths, Associate in Pediatrics and Assistant Attending Pediatrician, is spending three months with the group in collaborative work on cystic fibrosis. New programs include: the search for a method for the measurement of blood flow through the portion of a single lung, a method which involves nitrous oxide and the use of a body plethysmograph; the effects of removing particular components of lung tissue on the mechanical performance of the lung, and ap-

praisal of inhomogeneity of pulmonary ventilation and perfusion from the gas phase, an investigation which involves the use of indwelling arterial needle and a polarographic method for measurement of rapid changes in oxygen tension.

Dr. Turino spent six months with Professor Meyer learning techniques for the analysis of lung tissue for polysaccharide components. He is now continuing this work on autopsy specimens of normal and diseased human lung tissue. With the purpose of relating the biochemical characteristics of lung tissue to physiologic as well as to anatomic abnormalities, an attempt is being made to determine the effects of certain enzymatic substances which are active against connective tissue upon the mechanics of breathing in animals *in vivo*. Substances under study include Papain, Hyaluronidase, Elastase and Trypsin. To evaluate the role of specific factors in the control of pulmonary capillary blood flow free from overall changes in pulmonary ventilation and blood flow, Dr. Turino has undertaken studies of pulmonary capillary blood flow in isolated segments of human lung *in vivo*. For this purpose, a technique of occlusive bronchial catheterization has been developed and a method for the measurement of pulmonary capillary blood flow using nitrous oxide is under investigation.

Studies of Bronchopulmonary Disease

Professor Alvan L. Barach has reported the development of a pocket oxygen dispenser which, with six cylinders, provides seven to ten minutes of thirty to forty percent oxygen inhalation. In collaboration with Professor Hylan A. Bickerman, Drs. Gustav J. Beck and Krishan G. Nanda, he has investigated the pulmonary ventilation of thirty-five patients with pulmonary emphysema during exercise, air breathing and forty per cent oxygen breathing with the Oxy-Hale device. In another study, carried out in collaboration with Drs. Judith I. Berg and Eduardo R. Pons, Jr. the electrocardiographic changes in patients with coronary disease were investigated at rest and after exercise in respect to modifications produced by inhalation of forty per cent oxygen. These studies are part of a broad program concerned with the emergency use of oxygen by portable apparatus suitable for the doctor's bag.

Professor Bickerman and Dr. Beck have col-

laborated with Professor Barach in making further studies of a heated aerosol method as a possible aid in the diagnosis of carcinoma of the lung and primary atypical pneumonia. An intermittent positive pressure breathing device was modified to make its use possible in conjunction with the heated aerosol in order to improve distribution of the hypertonic salt-propylene glycol mixture in parts of the lung which are poorly ventilated during spontaneous respiration. A diagnostic survey of the induction of expectoration by the heated aerosol method in patients with pulmonary tuberculosis was conducted by Dr. Nanda. In patients who were unable to produce sputum spontaneously for diagnosis, the heated aerosol was valuable in producing bronchial washings adequate to make a bacterial diagnosis.

Hypertensive Disease

Professor Perera has continued his clinical investigations of hypertensive disease. Data secured in a large series of elderly patients, several of whom have survived for more than forty years after diagnosis, suggest that the "floor" of the diastolic blood pressure may be of greater significance in determining longevity than the mean or peak values. A long-term study of the effects of antihypertensive drugs does not support the thesis that they modify survival. Together with the Department of Public Health and Administrative Medicine, Professor Perera has embarked upon a lengthy survey of the impact of genetic and acquired factors in the incidence of primary hypertension. He has extended his observations concerning the rarity of blood group A in Negro women with accelerated form of disease. He is now recording the effects of antithyroid and massive steroids as possible therapeutic agents.

Professor Abbie I. Knowlton has continued studies on the hypertension induced by adrenal steroids. Studies in collaboration with Dr. Herbert C. Stoerk of the Merck Institute for Therapeutic Research have demonstrated that the influence of corticosterone (B) on blood pressure resembles hydrocortisone rather than DCA in that significant elevations in blood pressure developed in animals injected with B while maintained on a sodium restricted regimen (approximately one-half of the rats) and secondly, that no more striking elevations in blood pressure were ob-

served in a comparison group provided with a liberal sodium intake. Studies are currently under way to characterize more precisely corticosterone hypertension and adrenal regeneration hypertension.

Dr. Gerald Cohen made studies in collaboration with Dr. Paul E. Hochstein of the inhibitory effects of the various ortho- and para-dihydric phenols and of related quinones on the glycolyzing ability of various mouse tissues. A possible *in vivo* role for dihydric phenols and quinones in regulating certain aspects of central nervous function is currently under investigation. In addition, Dr. Cohen has investigated the urinary excretion of 3-methoxy, 4-hydroxy, mandelic acid in collaboration with Dr. Stanley Gitlow of Mt. Sinai Hospital.

Renal Physiology

During the past year, Professor Laragh has continued studies of electrolyte metabolism and hormonal factors involved in the production of edema and hypertensive states. Associated with Professor Laragh during the past year have been Dr. Wodzimierz Januszewicz of Warsaw, Poland, a Fellow of the Rockefeller Foundation, and more recently, Dr. Marielena Angers of Mexico City. Dr. Edward Sonnenblick, an Assistant Resident in Medicine, has also participated in the work. In collaboration with Drs. Heinemann and Demartini, Professor Laragh has found that renal clearance studies indicate action of chlorothiazide at a different site in the kidney than that acted upon by the mercurial diuretics. More recently, studies have been made of inhibitors of aldosterone. These compounds are of interest because they may provide information concerning the mode of action of aldosterone and because they increase sodium excretion without producing potassium loss. In collaboration with Dr. William G. Kelly and Professor Liebermann of the Departments of Biochemistry and Obstetrics and Gynecology, a complicated technique utilizing tritium-labelled hormone has been set up which permits the precise measurement of the amount of aldosterone actually secreted by the adrenal glands. Marked increases in aldosterone secretion have been found in cirrhosis and nephrosis but not in heart failure. No increase has been found in essential hypertension, but patients with

malignant hypertension produce large excesses of the hormone. Further studies of the relationship of aldosterone to hypertension are currently under way. In addition, a study of the sensitivity of hypertensive patients to noradrenalin, originated in association with the late Dr. Marcel Goldenberg, is being continued.

Dr. Demartini has continued his interest in the mechanism of urate excretion in man. The effects of various agents and clinical states on uric acid excretion have been carried out in the Dalmatian dog and man. Studies on the effects of chlorothiazide on urate metabolism following its prolonged administration and after acute intravenous administration have been completed. The effect of pH on urate excretion is being studied in patients with diabetic acidosis, metabolic alkalosis and respiratory acidosis. Many of these investigations have been carried out in collaboration with Dr. Earl A. Wheaton, Jr., Chief Resident in Medicine.

Hepatic Physiology

Professor Bradley and Dr. Henry O. Wheeler have continued their investigations of hepatic physiology in dogs and man. In collaboration with Drs. Norman B. Javitt, Oswaldo L. Ramos, David G. Edwards and Robert Whitlock, further study of bromsulphalein conjugation has been made. It has been found that bromsulphalein combines glutathione *in vitro* to produce an ninhydrin-positive conjugate, which is separable into several moieties resembling those found *in vivo*. Mrs. Katherine J. Baker has been able to demonstrate a one-for-one molar relationship between bromsulphalein in glutathione in this combination. Using S^{35} -tagged glutathione, Dr. Javitt has been able to show that the radioactive isotope appears in all of the conjugates in the bile of the rat. New derivatives appear to form in the bile by the cleavage of glutamic acid and glycine. Dr. Edwards and Dr. Javitt have been able to produce a lesion in the liver of rats given very large doses of bromsulphalein which appears to be correlated with a glutathione deficiency of the liver.

Dr. Wheeler has conducted studies relating to the excretory transport mechanisms in the biliary tract, and has continued his exploration of the determinants of flow and electrolyte composition of the bile. This work has been carried out in

collaboration with Drs. Ramos and Whitlock using unanesthetized, cholecystectomized animals equipped with Thomas duodenal cannulae. Studies of the taurocholate transport mechanism, now in progress, reveal a transport maximum whose magnitude is about ten times as great as the bromsulphalein "Tm."

The Faulkner Arthritis Group

With the help of a grant from the National Foundation, clinic facilities have been augmented by the employment of five additional ancillary personnel. This has permitted an extension of the training program by opening up the possibility of providing an experience in social service and physical medicine for trainees. It has also resulted in a return to a retrospective study of experience with adult rheumatoid arthritis with 500 patients. This group is one of those participating in the Cooperative Clinic Study on Therapeutic Evaluation in Rheumatoid Arthritis. Dr. Albert W. Grokoest is continuing his study of juvenile rheumatoid arthritis and Dr. Arthur I. Snyder has started a special clinic for systemic lupus erythematosus. Seminars for the fourth year medical students during Group Clinic period continue and the clinical clerks at Goldwater Memorial Hospital are seen at regular intervals by members of the group. Three visiting fellows are now with the group: Dr. Wendell B. Hatfield, Dr. Louis A. Healey and Dr. David A. Kaplan.

Dr. Christian is continuing his efforts to characterize rheumatoid serological reactions. A technique that permits *in vivo* decomplexation of animals has been used in collaboration with Dr. Pierre Lambert to study the role of serum complement in the mediation of immune phenomena. Dr. Hatfield is investigating the spontaneous cold precipitation of LE sera. Indirect evidence suggests that this may be an immunologic phenomenon. With Mr. Robinson, Dr. Christian is making a study of homograft (skin) reactions in rabbits. A purine antagonist (6MP) that has been shown by others to block antibody production is being used to block homograft rejection.

Professor Daniel L. Larson, in collaboration with Drs. Snyder and Wheaton, has carried on a study of the incidence of serologic abnormalities in members of families of patients with systemic

lupus erythematosus. He is collaborating with Dr. L. Shulman of Johns Hopkins University in a study of the relationship of these two disorders. In association with Drs. Dorothy Estes, Tor Richter and John A. Wood, a long-term follow-up study is in progress on patients who have undergone mitral commissurotomy. Professor Michael J. Lepore of this clinic and Drs. Thomas B. Tomasi, Jr. and Henry Holman of the Rockefeller Institute, are collaborating with Professor Larson in a study of the occurrence of abnormal proteins in the serum of patients with connective tissue disorders which will react with saline extracts of normal human organs.

Connective Tissue Studies

Professor Meyer has continued to carry on the studies of the chemical structure and biological functions of the mucopolysaccharides of connective tissues. Recently, work has also been carried out with a chemically related substance, the mucopeptide, derived from the cell wall of a gram-positive coccus and its enzymatic degradation by lysozyme. Work on the chemical structure of keratosulfate of bovine cornea has been brought nearly to completion by Dr. Shigehiro Hirano, a guest from Kyoto University, and by Dr. Philip Hoffman using classical techniques. These chemical studies will now be supplemented by a study of the structure of oligosaccharides produced enzymatically from keratosulfate by extracts of a microorganism which has been found by other laboratories to degrade blood group substances. Dr. Kaplan and Professor Meyer have found that keratosulfate accumulates in costal cartilage with age. These studies are now being extended to age changes in human aorta. Dr. Hoffman has completed his work on the structure of chondroitin sulfate B. Thus the structures of all three chondroitin sulfates have been elucidated, in the main, by work from this laboratory, where also the existence of the three isomeric chondroitin sulfates was first demonstrated. Dr. Alfred Linker has attempted to purify a bacterial enzyme which hydrolyzes heparitin sulfate, the last remaining mucopolysaccharide whose structure is still unknown and to identify the hydrolysis products. Professor Meyer has continued his studies on Hurler's syndrome, a heritable disease of connective tissue. In this disease it has been

found that two chemically unrelated mucopolysaccharides, chondroitin sulfate B and heparitin sulfate, are excreted in the urine and stored intracellularly in various organs. Attempts are being made, in part in collaboration with Dr. Melvin M. Grumbach, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, to study the nature of the genetic defect and to find methods of arresting the process.

The research of the Allergy Clinic during the past year has been centered upon further investigation of the release of histamine from the leukocytes of allergic patients when antigen is added. Dr. Elliott Middleton, Jr. has been most active in pursuing this program. The Clinic has also continued a study of the efficacy of various bacterial antigens in treating bacterial allergy. No conclusive results are available as yet.

Hematology

Professor Joseph C. Turner has continued studies of the biochemistry of the red cell membrane. With funds generously provided by the Avalon Foundation, a gas chromatograph has been purchased and further detailed analysis of the lipid composition of membranes is being undertaken. Dr. Helen M. Anderson has carried out many of these studies in collaboration with Dr. Turner. A method of preparing red cell membranes has been developed which yields microscopically intact membranes containing reproducible amounts of nitrogen, phosphorus and total solids as well as hemoglobin. The latter has been found to represent three per cent of the total hemoglobin of the intact cell, and appears to be firmly bound to the membranes that are prepared in this way. Further studies of the chemical constitution of red cell membranes in normal individuals and in patients with various anemias and other hematological disorders are being undertaken. In particular, the fatty acid composition of the red cell lipids will be studied employing silicic acid column and paper chromatographic separation of phospholipids of the membranes and gas-liquid chromatography of the fatty acids. The interrelation of red cell lipid composition with that of the plasma will be examined. In addition, these techniques will be applied to the study of blood platelets, since there is good evidence that platelet function is depend-

ent, in part at least, upon the lipid moiety. A study of patients with coagulation disorders has been continued and their deficiencies in terms of known coagulation factors documented. This study has been extended to include starch gel electrophoresis of protein fractions of plasma in an effort to isolate and purify active components in coagulation.

Dr. Ranney has continued studies of inbred strains of mice in collaboration with Dr. Salome Glueckson-Waelsch of the Albert Einstein College of Medicine. An investigation of the siderocytic mice of Gruneberg, a mutant inbred strain showing pleiotropic effects, has been undertaken. Erythrocyte life span studies in adult and newborn animals of this strain indicate a major defect in erythropoiesis during early life. In collaboration with Dr. Frederick A. Klipstein, a study of the "membrane hemoglobin" of human erythrocytes was conducted which indicated some increase in the electrophoretically slow components of hemoglobin of the membranes as opposed to the water soluble hemoglobin. With Dr. Daniel Malcolm, a study of the localization of chromium⁵¹ in the hemoglobin of tagged human erythrocytes has been inaugurated.

Pharmacologic Studies

Professor Charles A. Flood and Dr. James A. L. Mathers have continued their studies of disorders of esophageal motility with reference to the effect of drugs upon the mechanisms of pain or dysphagia. In the Ulcerative Colitis Clinic, Professor Flood is conducting a long-term study of the natural history of the disease and the influence of hormonal therapy upon it.

Dr. Isidor Mufson has found that regional heparinization may be helpful in the management of phlebitis. He is evaluating the use of histamine in the treatment of arterial occlusive disease.

Dr. Aranow has continued his studies on myasthenia gravis in collaboration with Dr. Paul F. A. Hoefler, Associate Professor of Neurology and Attending Neurologist, and Dr. Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist. Since understanding is hampered by the absence of a precise criteria for the definition of disease, these workers have suggested the use of certain pharmacologic criteria as a help in resolving some of

the apparent contradictions. The sensitivity to curare of patients with various diseases affecting muscle is being systematically investigated and trials with new therapeutic agents which show promise are being continued.

Dr. Kermit L. Pines reported his studies on the use of chlorpropamid in diabetic patients in the Annals of the New York Academy of Sciences. Collaborating with Drs. Edgar Leifer and DeWitt S. Goodman, he showed that the recently introduced oral hypoglycemic agent is effective in causing a decrease in blood sugar and unesterified fatty acid levels in some diabetic patients. He is continuing his metabolic studies in the field of calcium metabolism. Dr. Hans W. Neuberg is working in association with Dr. Pines and has continued studies on the vibratory sense of diabetics and normal controls.

At Bellevue Hospital

THE CLINICAL SERVICES

Both the First Medical and the Chest Services continued to be very active as usual during the past year, with a high inpatient population and an ever-increasing outpatient census. This is worthy of special notice in the case of the Chest Service, in view of the decline in hospitalized tuberculosis patients in the city generally, and indicates that the Bellevue Chest Service continues as a major center for the city's care, evaluation, and distribution of these patients.

The importance of large active clinical services of this kind, for teaching and research, as well as for patient care, cannot be over-estimated. On both the First Medical and Chest Services, all second year students receive a part of their instruction in physical diagnosis, and all fourth year students a two-month period of intensive clinical training. On the Chest Service, interns are assigned from the First, Second, and Third Medical Divisions, in addition to its large resident program. During the current year, seventy-six interns and residents received training on this division.

A large and varied clinical service is essential to an active program of clinical research, and each of these activities supplements and supports the other. As has been the case over many years, the Cardiopulmonary Laboratory and the First Medical and Chest Services form a single team,

the availability of carefully treated patients for study, from the clinical divisions, being matched by the outstanding service which the Laboratory provides in the diagnosis and management of patients with cardiopulmonary disease, especially of the more difficult cases. This diagnostic and consultative service is in fact provided by the Cardiopulmonary Laboratory for all hospital divisions, those affiliated with Cornell and New York Universities as well as Columbia.

Research

THE CARDIOPULMONARY LABORATORY

Of greatest interest in the past year has been the development of the use of radioactive krypton (Kr^{85}) in the study of circulatory and pulmonary physiology in man. Dissolved in water and injected intravenously, this gas is cleared from the blood almost completely in a single passage through the lungs. This phenomenon leads to a number of physiological applications.

In a preliminary paper, Professors Fritts, Jr., Cournand and Richards, with Drs. Charles A. Chidsey and Alfred H. B. Hardewig, described the passage of Kr^{85} from blood to lungs, and developed equations by which, among other things, moment-to-moment blood flow through the lungs can be measured continuously during a Kr^{85} infusion. Professor William A. Briscoe, with Drs. Hardewig, George Emmanuel, Hans P. Gurtner, and Dudley F. Rochester, is reporting on the passage of Kr^{85} from blood to lungs and from lungs to expired air, as a measure of ventilation-perfusion relationships in both the active and the stagnant lung compartments. Professor Fritts and his associates will report shortly on the use of Kr^{85} to define arteriovenous shunts: both those within the lung and those outside the lung, from systemic vessels direct to pulmonary veins.

Professor Briscoe is publishing his extensive researches on the distribution of inhaled air in normal and emphysematous subjects.

Professor Fritts and Dr. Anne L. Davis have reported on the effects of oxygen inhalation in depressing the pulmonary ventilation of patients with chronic carbon dioxide retention.

Professors M. Irené Ferrer and Réjane M. Harvey are continuing their studies of the effects of exercise on the circulation in patients with heart disease.

THE CHEST SERVICE AND FIRST MEDICAL DIVISION

Clinical evaluation of two new antituberculous drugs has been carried out by Professors McClement and Jones, Drs. David G. Simpson, Edgar A. Riley, and Eleanor S. Nash. Kanamycin, a drug discovered in Japan, has been found to be effective against tuberculosis, but has serious toxic properties, notably the production of deafness. Streptovaricin, another antibiotic, has beneficial effects, according to preliminary observations, with no serious toxic properties thus far demonstrated.

In the Chest Service Clinic, under Professor Jones and Dr. Jean F. Huddleston, a study of the contagiousness of patients under treatment with tuberculosis is being conducted by following the incidence of new infections among patients' families. Data are available on 1422 associates of 382 patients. Among this group, seven cases of tuberculosis have been encountered, four of whom had been previously infected; the other three occurred in infants of patients who had left the hospital against advice.

The long-term study of treated extra-pulmonary tuberculosis continues under Professor Jones and Dr. Robert R. Henderson. These cases, 312 in number, will be finally evaluated after a five-year observation period.

In the large and active Emphysema Clinic, study of the bacterial complications, and the effectiveness of chemoprophylaxis, is being continued under Professor McClement and Dr. Davis. The clinical and physiological changes in these patients are being followed on a long-term basis by Drs. Davis and Simpson.

On the First Medical Division, clinical study of diuretic agents is being continued by Professor Harvey, with Drs. James R. Golob, Morton A. Rosenblum, and Michael C. McNalley. A new carbonic anhydrase inhibitor, dichlorphenamide, has promise both as a diuretic and in lowering bicarbonate. Dihydrochlorothiazide is a diuretic several times more potent than the parent compound. An interesting case of potassium-losing nephritis was published by Drs. Burton A. Lerner and Philip M. Brickner.

COLLABORATIVE RESEARCH WITH DEPARTMENT OF PATHOLOGY

Studies of the biochemical characteristics of

the lungs are being conducted by Dr. Anne M. Briscoe in collaboration with Dr. William E. Loring of the Department of Pathology. The elastic tissue of the lung, as determined by its content of elastin, increases with age, but is decreased in lung tissue adjacent to bullae. Lipid content of lung decreases, and hydroxyproline content increases, with age. Dr. John B. Cromie is studying pulmonary emphysema by the preparation of whole-lung sections by the Gough technique and comparing anatomical findings with the physiological abnormalities previously observed and followed during life by the Cardiopulmonary Laboratory.

At Delafield Hospital

At the Delafield Hospital the integrated program of teaching, patient care, and research of the Medical Service has continued vigorously and productively. In addition to the third year students who spend an elective period on the medical wards, the program of externships for fourth year students at Rochester has continued and has been extended to senior students from Harvard Medical School. Seven residents and four fellows have had a specialized training in the medical problems of neoplastic disease in the past year. Laboratory and clinical research has concentrated on the patho-physiologic and biochemical mechanisms of disease. The immediate problems of disseminated cancer were examined by means of an evaluation of therapeutic agents. It is of some interest, that in each of the studies on mechanism, information has been gained which has relevance to non-neoplastic disease as well as to some aspect of tumor-host relationships. Thus, rapid advances in the knowledge of lipid chemistry and biophysics, together with improved instrumentation have paved the way for investigation of lipid metabolism in neoplastic as well as degenerative diseases.

Research Activities

During the past year, in collaboration with Professor Marks, Professor Gellhorn has made studies on fat metabolism in patients with neoplasia. The first model system selected for investigation has been a comparison of fatty acid synthesis, oxidation, and transfer in normal human adipose tissue and lipoma. Factors control-

ling lipid metabolism in the normal and the neoplastic cell are under investigation.

Professor Osserman continues to concentrate his interests upon the plasma cell proliferative diseases, that is, multiple myeloma, primary macroglobulinemia and the related dysproteinemias. In the past year, he has paid particular attention to the technique of immunoelectrophoretic analyses of serum and urinary proteins. This approach has been demonstrated to be of major value in elucidating the interrelationships of the paraproteins with one another and with the normal immunoglobulins, gamma major (γ -2), gamma minor (β 2A), and the gamma macroglobulin (β 2M). In collaboration with Dr. Konrad Hsu, Associate in Microbiology, and Dr. Beatrice Seegal, Professor of Microbiology, a study of the pathogenesis of primary amyloidosis has been instituted, using the fluorescent antibody labelling technique. Preliminary results of study support the hypothesis that the tissue infiltrates, that is, the paramyloid deposits are related to the pathological urinary proteins of the Bence Jones variety.

Dr. George A. Hyman is working on a project for testing TEM and other chemotherapeutic agents in the treatment of retinoblastoma in children. Dr. John E. Utlmann has explored the life span of the red cell, glycolysis of the red cell and the role of the spleen in the production of the anemia of cancer. In collaboration with Dr. Philip Feigelson, Assistant Professor of Biochemistry, Dr. Utlmann has made a study of the mechanism of action of therapeutic agents, finding that 8-azaguanine and 6-mercaptopurine inhibit xanthine oxidase *in vitro* as well as *in vivo* in the rat, whereas uricase is not affected.

Professor Marks has continued his studies with Dr. Arie Szeinberg, a visiting Professor from Israel, and Professor Ruth T. Gross of the Department of Pediatrics at Stanford University School of Medicine upon the mechanism by which a genetic alteration results in glucose-6-phosphate dehydrogenase deficiency. Evidence has been obtained that this enzyme deficiency is expressed more severely among affected Caucasians than affected Negroes. With Dr. Francisco Alvarado, investigations continue into the effect of age on red cell permeability and hexose phosphorylation. In addition, an attempt is being made to evaluate

the role of specific factors, such as pyridine nucleotides, in stabilizing red cell enzymes.

Dr. Heinemann, together with Drs. Cemil Emirgil and Jan P. Mijnsen, has studied pulmonary function in patients before and after definitive radiotherapy to the thorax. In addition Dr. Heinemann and his associates have characterized the hyperventilation and hypokalemia of cirrhosis, which they have found cannot be explained by potassium deficiency, respiratory alkalosis or excessive renal potassium loss.

At Goldwater Memorial Hospital

The integrated program for patient care, research, and education at the Goldwater Memorial Hospital is now in its twenty-fourth year. Strong support continues to be given this University enterprise by the Departments of Hospitals and Health, the Federal Government, and a number of private philanthropic agencies. Today there is full acceptance of the principle that the long-term patient should be treated with the same fidelity and dignity usually afforded the acutely ill patient. At the Columbia University Goldwater Unit fourth year students are in continual attendance to participate in this approach. Their educational opportunities extend beyond those of good patient care since they are in close association with investigators in the field of chronic disease.

Research Activities

Studies on the relationship between lipid metabolism and experimental and human atherosclerosis continue to be a major interest of the Columbia Service. Professors Kendall, Liese L. Abell and Erwin H. Mosbach have shown that the oral administration of large amounts of methyltestosterone to dogs maintained on high cholesterol diets or on large oral dosages of thiouracil results in a plasma lipoprotein pattern in which the amounts of cholesterol transported in the alpha and beta-lipoprotein fractions are the same as the amounts found in these fractions in man. Professor Mosbach and Dr. Margaret Bevans, Director of Laboratories, New York Infirmary and Consultant to Columbia Research Division, have completed a study of the early pathologic and biochemical lesions in rabbits fed dihydrocholesterol. They report lesions of the

biliary tract, consisting of edema, cellular infiltration and gall stones, seven days after institution of 0.5 per cent dihydrocholesterol feeding. Professor Mosbach and Drs. Jaime Blum and Bevans have also studied the effect of hormonal factors on the experimentally-induced cholelithiasis and on the biologic disposition of dihydrocholesterol in the rabbit.

Professor Arthur R. Wertheim, Dr. Juan G. Edreira and Dr. Seraphine Bern have demonstrated better definition of serum lipids after electrophoretic separation on paper by a change in the staining time with oil Red O from the conventional sixteen hours to six hours. In collaboration with Professors Kendall, Mosbach and Abell they are attempting to develop a standardized fat tolerance test.

Professor Daniel Rudman, with Dr. Mario DiGirolamo and Dr. Howard W. Goldbas, is continuing his investigation of the adipokinetic function of the pituitary gland which appears to act directly upon the fat cell in adipose tissue by stimulating the release of stored triglyceride into the circulation in the form of unesterified fatty acids.

Drs. Henry Lax and Arthur W. Feinberg have continued their studies of the arterial pulse wave and its modification in various disease states. Their findings seem to support the concept that some of the vascular changes seen in diabetes mellitus are an integral part and not a complication of the disease.

Professor Alfred Steiner, with Dr. Suat Akgun, is continuing studies on the effect of neomycin on the serum lipids of patients with coronary atherosclerosis. The oral administration of neomycin (0.5 to 4.0 gm. daily) has been carried out for twenty-seven trials in twenty-two patients for periods up to five months. A significant fall in the serum cholesterol level occurred in each individual within two weeks and was maintained for the duration of the drug administration. The average decrease in the serum cholesterol level at the 1-2 gm. dose level was 21 per cent. The total serum lipids and the serum phospholipids also decreased but the serum cholesterol, serum phospholipid ratio remained unchanged.

Professor Deming, with Dr. Daly, has completed clinical evaluations of reserpine alone and combinations of reserpine with hydralazine in

the management of patients with advanced hypertensive disease. Thirty-six individuals were treated only with reserpine. The drug was given orally with dosage increased until effective control or toxicity was reached. On this program, twenty-three exhibited falls in diastolic blood pressure in excess of 10 mm. Hg. However, only four reached persistent diastolic levels less than 90 mm. Hg. Large initial oral dosages of reserpine shortened the time necessary for demonstration of effect from weeks to days and were found as practicable as the more conventional large parenteral dosages. Toxic manifestations when large dosages were maintained were as frequent with reserpine as with other antihypertensive drugs. Dr. Daly is studying the effects of epinephrine and norepinephrine on the metabolism of isolated rat aorta. The effects of the hormones on aorta obtained from normotensive and hypertensive rats are being compared. Dr. Daly, Professor Deming and Dr. Blum are studying the metabolism of aortas of hypertensive rats treated with antihypertensive drugs. The results obtained so far suggest that the changes in composition and metabolism which occur when animals have been hypertensive for several months are reversed when the blood pressure is lowered by means of antihypertensive drugs.

Professor Arthur J. Patek, with Drs. Bevens and Arthur Sakamoto, Mr. Donald E. Oken and Mrs. Nancy M. DeFritsch, reports studies in the rat of the recovery phase of dietary cirrhosis of the liver. Reabsorption and disappearance of connective tissue in the liver have been demonstrated by microscopic study and determination of collagen content. The relation of constitutional factors to the development of cirrhosis in the rat is now under investigation. Rats are being inbred to determine whether or not there is a genetic factor in the susceptibility of the animal to dietary cirrhosis.

Professor Bickerman and Miss Sylvia E. Itkin, employing methods they have developed to study the air-flow dynamics of cough, have evaluated the antitussive properties of thirteen preparations by the double-blind technique in normal subjects. By this method it was possible to separate the thirteen coded drugs submitted for evaluation into effective and ineffective antitussives. With

Professor Barach, the aerosol technique for obtaining bronchial secretions for cytologic examination has been improved by employing heated hypertonic glycol-saline solutions in conjunction with intermittent positive pressure breathing. The sputum cytology of patients with atypical (viral) pneumonia and patients receiving radiation therapy to the chest are being studied with the assistance of Professor Edith E. Sproul, Assistant Professor of Pathology. Professor Bickerman and Dr. Berg are evaluating the effects of oxygen both at rest and after exercise on the minute ventilation of patients with pulmonary emphysema. The effects of oxygen on the electrocardiogram and ballistocardiogram in patients with coronary artery disease before and after exercise are under investigation.

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Microbiology

HARRY M. ROSE, *Borne Professor and Chairman of Department*
Attending Microbiologist and Associate Attending Physician

The physical facilities for teaching and research in the department are now inadequate and provision for their improvement must soon be made. Laboratory space essential for the instruction of medical and dental students has been dangerously reduced in size so as to satisfy partially the urgent demands of investigative work, and the situation is now one in which both functions are severely handicapped.

We report with sorrow the death of Dr. Ada R. Clark on November 26, 1958, and of Dr. Nicholas Kopeloff on September 4, 1959. Dr. Clark entered the department in 1923 and retired as Associate in Microbiology in 1952. She served as assistant to the late Dr. Frederick P. Gay and throughout her tenure made important contributions to the departmental program. Dr. Kopeloff was affiliated with the New York State Psychiatric Institute from 1920 until his retirement in 1956, and from 1940, was Assistant Professor of Microbiology. His many noteworthy accomplishments included pioneering work on the pathogenesis of demyelinating encephalomyelitis.

The department was honored by several distinguished visitors who participated in seminars of unusual interest. Dr. S. Fazekas de St. Groth, Australian National University, Canberra spoke on "The neutralization of animal viruses." Dr. Michael Stoker, incumbent of the newly-created Chair of Virology, University of Glasgow, discussed "Growth studies with herpes virus." Dr. R. R. Porter, National Institute for Medical Research, London gave a talk concerning the "Structure of antibodies." Dr. Anne-Marie Staub, Pasteur Institute, Paris lectured on "The chemical basis of the Kauffmann-White classification scheme for *Salmonellae*." Dr. W. Bernhard, Institute of Cancer Research, University of Paris presented observations on the "Electron microscopy of tumor viruses."

Dr. Rosa Lee Nemir, Professor of Pediatrics, New York University College of Medicine, spent a sabbatical year as Visiting Professor of Micro-

biology, during which time she investigated the cytopathic effects of adenoviruses in tissue culture. Post-doctoral students included Dr. Gian Carlo Nava, University of Rome, who worked under a Damon Runyon Fellowship; Dr. Arthur J. L. Strauss, under a fellowship from the National Institutes of Health, and Dr. Richard A. Rifkind, under a fellowship from the National Foundation. In addition, Dr. Paul B. Sigler carried on investigative work while a fourth year medical student and received the Borden Award for his studies of the effect of ionizing radiation on nucleic acids. Currently, Mr. Henry M. Bowers, Jr., a member of the third year class, is working for a year under a student fellowship from the National Institutes of Health on the nature of the proliferative tissue response to vaccinia virus.

Four graduate students were in residence, of whom one, Dr. Joel W. Goodman, received the Ph.D. degree. Dr. Goodman was the recipient of a National Institutes of Health post-doctoral fellowship and, currently, is working with Dr. R. R. Porter at the National Institute for Medical Research, London.

Dr. Beatrice C. Seegal was promoted to Professor of Microbiology. Dr. Solon A. Ellison and Dr. Alice W. Knox were each promoted to Assistant Professor of Microbiology. Dr. Elvin A. Kabat, Professor of Microbiology, took sabbatical leave for one year and went to the Pasteur Institute, Paris, where he is continuing his studies of the reactive sites of antibody molecules, and completing a second edition of his well-known monograph "Experimental Immunochemistry," written in collaboration with Dr. Manfred M. Mayer, Professor of Microbiology, Johns Hopkins University.

Dr. Harry M. Rose, John E. Borne Professor, Attending Microbiologist and Associate Attending Physician, together with Dr. Charles A. Ragan, Professor of Clinical Medicine and Associate Attending Physician, were the joint recipients of an award from the Gairdner Charitable

Foundation, Toronto, Canada for their discovery of the differential sheep cell agglutination test, which is useful in the diagnosis of rheumatoid arthritis.

The extensive and varied research programs in the department continued at a high level of activity, leading to publication of fifty papers, exclusive of abstracts, in the period of this report. The work was supported mainly by grants from the National Institutes of Health, the National Foundation, the Office of The Surgeon General (Army), the Office of Naval Research, the Jane Coffin Childs Memorial Fund and the William J. Matheson Commission Gift. Special mention should be made of aid from the Mary Murray Mahony Fund, which made it possible to initiate studies of a fundamental nature dealing with viruses and their relation to neoplastic disease.

Dr. Rose, in collaboration with Dr. Knox, extended his studies of acute respiratory disease at Fort Dix under the Commission on Influenza, Armed Forces Epidemiological Board. Further evidence was obtained that immunization against influenza and adenovirus infections can be successfully accomplished with killed virus vaccines of appropriate composition. It was also ascertained that rises in the titer of complement fixing antibody to influenza virus following immunization with Asian-type vaccine apparently provide an index of protection which is as good as that obtained from study of the increase of neutralizing or hemagglutinin-inhibiting antibody.

Dr. Seegal, in association with Dr. Konrad Hsu, continued studies of experimental nephritis by the use of the fluorescent antibody technique. It was established that elements of the nephrotoxic serum are demonstrable in the glomeruli of rats, dogs and rabbits during persistence of the nephritis. No nephritic animal examined, even up to ten months, failed to show evidence of this material. Excess amounts of the native serum globulins of these three species were also found in these same glomeruli. In cooperation with Dr. C. Cassano, Dr. E. Fiaschi and Dr. G. Andres, Institute of Medical Pathology and Internal Medicine, University of Rome, an investigation was begun to determine the usefulness of the fluorescent antibody technique in gaining information concerning the pathogenesis of certain forms of human glomerulonephritis. Dr. Andres arranged

for the delivery of selected renal biopsies for study by the fluorescein technique and, with Dr. Fiaschi, is carrying out parallel light and electron microscopic studies of this biopsy tissue. In association with Dr. Herbert Kayden, Associate Professor of Medicine, New York University, the problem of the antigenic specificity of low density human lipoproteins was studied by the immunologic methods of Ouchterlony and of Scheidigger, and by the fluorescent antibody technique. This latter approach is used for the purpose of determining the localization of these lipoproteins in tissues other than blood. Mr. Stanley H. Appel, a fourth year medical student, used the fluorescent antibody technique in Dr. Seegal's laboratory for the study of experimental encephalomyelitis, a project which is being carried on in the laboratory of Dr. Abner Wolf, Professor of Neuropathology and Attending Neuropathologist. An exhibit of the application of the fluorescent antibody technique to experimental nephrotoxic nephritis was presented at the VIIth International Congress of Microbiology, Stockholm, August 1958. An extension of this exhibit was shown at the meetings of the Federation of American Societies for Experimental Biology, Atlantic City, April 1959. Dr. Seegal was on sabbatical leave from January 1 to June 30, 1959. During this time, she visited the Medical Clinic of Dr. Cassano, Rome and addressed the Academy of Medicine and Surgery on the subject of the application of fluorescent antibody technique to problems in experimental and human nephritis.

Dr. Claus W. Jungeblut, Professor of Bacteriology, in collaboration with Dr. Helen Kodza, continued his studies on interference reactions between certain neurotropic viruses. Tissue culture methods were used which permitted a quantitative study of the phenomenon. A new project dealing with the laboratory study of a transmissible leukemia in guinea pigs was begun. The disease could be transmitted by intracerebral injection of tumor material to a resistant strain of guinea pigs and was maintained over several serial passages. A tissue culture strain of leukemic spleen cells was established. This cell strain had no leukemogenic properties but served as a medium for cytopathogenic growth of several neurotropic viruses. Transmission of the disease was possible with centrifuged leukemic plasma

and spleen extract but did not succeed with filtered plasma.

An account of Dr. Kabat's work, which is carried out in laboratories at the Neurological Institute, under the Departments of Microbiology and Neurology, will be found in the report of the latter department.

Professor Calderon Howe, Associate Professor of Microbiology, conducted studies on the nature of purified receptor substances from erythrocytes and the enzyme(s) of influenza virus. Efforts were made to determine the basis for some of the striking differences noted between erythrocytes of different species with respect to viral hemagglutination and the capacity of purified erythrocyte receptor substances from different species to inhibit hemagglutination. Immunochemical studies on the nonhemoglobin proteins of human and animal erythrocytes were carried forward. A number of antigens were found to be present in a fraction of erythrocytes devoid of blood group and virus receptor activity. These antigens were separable immunoelectrophoretically and one or more appear to be involved in the mechanisms of panagglutination and hemolytic anemia. In collaboration with Dr. Paul di Sant'Agnese, Assistant Professor of Pediatrics and Assistant Attending Pediatrician and Mr. Fred E. Pittman, a fourth year medical student, a study was completed on the bacteriophage typing of staphylococci isolated from patients with cystic fibrosis of the pancreas, including limited family epidemiologic studies. In collaboration with Professors Rose and Councilman Morgan of Microbiology, work on animal viruses in tissue culture was continued with particular emphasis on viral development as revealed by electron microscopy. Investigation of an aerobic soil microorganism which splits blood group substances was completed in collaboration with Dr. T. E. Gilmore*, as partial fulfillment by Dr. Gilmore, of the requirements for the degree of Doctor of Philosophy.

Dr. Morgan extended his electron microscopic studies of intracellular viral development. In collaboration with Miss Ellyn P. Jones, a fourth year medical student, and Dr. Margaret Holden, tissue cultures infected with a new strain of herpes simplex virus were examined. The virus was found

to differentiate within the nucleus where crystallization frequently occurred. Based on this investigation, an hypothesis was formulated concerning the manner in which viral particles gain egress from intact cells. In association with Professor Gabriel C. Godman, the cellular alterations accompanying infections by herpes simplex virus were examined by electron microscopy and histochemical means. Studies of influenza virus were extended with emphasis on the nuclear changes accompanying infection. Dr. Michael Gregg, Assistant Resident in Medicine, examined the morphologic response of HeLa cells to infection by adenovirus and encountered an unusual alteration in the nuclear membranes.

Professor Sam M. Beiser continued an investigation of the chemical, immunochemical and biological properties of steroid hormone-protein conjugates, in collaboration with Professor Bernard F. Erlanger, Dr. Frederick J. Agate, Jr., Associate Professor of Anatomy, and Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology). It was found that steroid hormones coupled to rabbit serum albumin are antigenic in rabbits. Attempts, in collaboration with Dr. Nicholas P. Christy, Associate in Medicine, and Assistant Physician, to immunize humans with human serum albumin conjugates of the steroid hormones, were undertaken. The study of DNA-mediated transformation in pneumococcus was carried forward. Dr. Paul Sigler, while a fourth year medical student, investigated the effect of ionizing radiation on transformation and found that the decrease in activity of transforming DNA on exposure to these radiations is apparently due primarily to interference with adsorption to the pneumococcus. Studies on the fractionation of pneumococcal transforming DNA by ion-exchange chromatography were pursued in collaboration with Dr. Aaron Bendich, Sloan-Kettering Institute. With Professor Stuart W. Tanenbaum, a study of the specificity of the combining sites of proteins formed in response to the same determinant group was made. The results led to the conclusion that proteins from different species have similar specific combining sites when elicited by the same determinant group despite differences in the overall composition of the proteins.

Dr. Godman, in collaboration with Dr. Morgan

* Deceased November 5, 1959.

and Dr. Rose, studied the cytological and cytochemical events in intranuclear viral infection by types 5 and 7 adenovirus. Employing methods for examination of the same cellular areas in the electron microscope, and histochemically under the light microscope, DNA containing viral aggregations and nonviral bodies without DNA were identified. The changes in nucleic acid at each stage in infection were measured microspectrophotometrically. Nuclei infected with herpes simplex virus were examined in the same manner. With Dr. Arline D. Deitch, the nucleic acid and protein content of cell nuclei in each of the various stages of differentiation of the lymphocyte from the reticulum cell were estimated microspectrophotometrically and interferometrically in human lymph node material. The measurements indicated that the reticulum and stem cells constitute the dividing population — the more mature elements do not normally divide. In differentiation, there is a progressive loss of nonhistone nucleoprotein and of nuclear RNA; the DNA remains constant at the diploid level. Indications of a difference in protein content of small lymphocytes in peripheral blood as compared to those resident in lymph were found. With Mr. Charles Morris, quantitative determination of the production of acid mucopolysaccharides by cells in tissue culture was actively pursued. Achievement of growth of "pure" lines of cells of mesenchymal origin in "simplified" fluid media on a large scale, and elaboration of suitable micromethods for determination of hexosamine, uronic acid (acid mucopolysaccharide) and DNA (cell mass or number) permitted amount of mucopolysaccharide produced during a given period to be determined under controlled conditions on a per cell basis. Thus, about 6 to 8 micrograms of "average" mucopolysaccharide (hyaluronic acid + chondroitin) are produced per milligram DNA during a sixty to seventy hour period on media containing not over 2 to 5% of serum. It was found that addition or deletion of the supposed precursors — glucose or glutamine — beyond that required to maintain viability had no effect on the amount of mucopolysaccharide produced by murine osteoblasts. Production was maintained throughout the life of the cell. Human synovial cultures grown for more than two years continued to give abundant yields. The influence of certain

hormones is now under study. In collaboration with Dr. Keith R. Porter, Rockefeller Institute, a study of the fine structure of the developing chondroblast in rat embryos was made, with the intention of correlating the presence and appearances of cytoplasmic organelles with the formation of the fibrillar and interfibrillar (ground substance) components of the matrix. Adequate electron micrographs were obtained illustrating the components of embryonal and mature cartilage matrix; some relations of the fine fibrillar component to the cell cortex of the active chondroblast; the marked elaboration of the granular and agranular endoplasmic reticulum in connection with the matrix formation by the chondroblast and the appearance of the chondrocyte and senescent chondrocyte of more mature cartilage. In an associated histochemical study, the contents of the cytoplasm of the chondroblast were investigated. At the electron microscope level, the use of modified fixatives and of heavy metal "staining" of thin sections, was found to yield useful information on the precise relationships between cell and matrix.

Dr. Erlanger studied the mode of action of synthetic polypeptides related in structure to gramicidin S. It appeared that the mode of action of the acyclic peptides differs from that of gramicidin S despite structural similarities. Studies of the interaction of insoluble peptides with enzymes were continued. With Dr. William Cohen, properties of the "active center" of chymotrypsin were investigated through the reactivation of diethylphosphoryl chymotrypsin by nucleophilic agents. In collaboration with Drs. Beiser, Lieberman and Agate, an investigation of the chemical, immunochemical and endocrinological properties of steroid protein conjugates was extended.

Dr. Tanenbaum pursued his studies of the biosynthesis of various aromatic and heterocyclic antibiotics produced by *Penicillium* spp. Together with Dr. Emmett W. Bassett, Associate in Microbiology, the biogenesis of 6-methylsalicylic acid from acetate units, and the subsequent rearrangement of this metabolite to patulin, was investigated using C^{14} -labeled substrates. The mechanism of this molecular rearrangement using a cell-free enzyme system obtained from *Penicillium patulum* is being elucidated. The environmental factors necessary for the formation of the

tropolone derivative stipitatic acid by the related mold *Penicillium stipitatum* were also delineated. Dr. Paul Brenneisen is presently engaged in working out a systematic degradation of the tropolone ring system to be used in contemplated tracer experiments. Together with Mr. Michael Mage and Dr. Beiser, a series of experiments to demonstrate the existence of unity in the specificity of enzyme and antibody induction by the same determinant groups was carried out. In conjunction with Dr. Ellison and Dr. Beiser, the course General Microbiology, GS 111, was offered in the School of General Studies.

Dr. Ellison, in collaboration with Dr. Irwin D. Mandel, Assistant Clinical Professor of Dentistry studied the composition of human saliva. Comparisons were made of components disclosed by paper-electrophoresis with those identified by immunochemical agar-diffusion techniques. Most of the substances detected in saliva were serum proteins, but two unique antigenic constituents were also discovered: one was salivary amylase and the other of still undetermined nature. Three or four basic proteins also occurred regularly in parotid saliva. These proteins were associated with mucopolysaccharides and were not antigenic in rabbits. Quantitative immunochemical assays revealed that the amount of albumin in saliva exceeded the amount of gamma globulin. This observation was not in agreement with the results of free electrophoresis, but the apparent discrepancy was resolved when it was found by immunologic analysis that amylase and gamma globulin are not separated by electrophoresis under the usual conditions, and that, consequently, the component commonly labeled gamma globulin consists largely of amylase. Dr. Ellison, in collaboration with Dr. Ruth F. Hill, Radiation Research Laboratories, studied the growth of bacteriophages in radiation-sensitive mutant strains of *E. coli*. It was found that certain T phages underwent unadaptive host-induced modification when they were first irradiated with ultraviolet light and then propagated in a mutant strain of *E. coli* B. The mechanism of this phenomenon

is under further investigation.

Dr. Margaret Holden investigated the effect of adrenocortical steroids on cells *in vitro*. The action of hydrocortisone on the ability of fibroblasts to support the growth of vaccine virus was compared with concurrent cytologic changes in hydrocortisone-treated and normal cells. Similar studies with adenovirus, utilizing hydrocortisone-treated epithelial cells, were undertaken. The relative capacities of nine strains of herpes simplex virus to propagate in two stable strains of human epithelial cells (HeLa and amnion) and one strain of mouse fibroblasts were studied. Strains of herpes virus were recognized by three different types of reaction in HeLa cells: rounding, some granulation and piling up of cells on a background sheet of growing cells; rounding, clumping without piling, accompanied by small giant cells; rounding with development of enormous giant cells with many nuclei. There was no consistent difference between the pocks produced on chick chorioallantoic membrane by these strains. The titers were similar and all strains were neutralized by herpes immune serum.

The laboratories of the Diagnostic Service performed a total of 65,397 examinations of which approximately thirty per cent were standard serologic tests for syphilis. In addition, tests for antibiotic sensitivity and bacteriophage typing were carried out on 4,047 strains of *Staphylococcus aureus*.

The research in the department has been supported by grants from the American Cancer Society, American Otological Society, Bristol-Myers Company, Cancer Chemotherapy National Service Center, the Jane Coffin Childs Memorial Fund, General Ceramics Company, Dr. Philip Hanson Hiss, Jr. Memorial Fund, Sister Elizabeth Kenny Foundation, Inc., the Leukemia Society, the National Foundation, the National Institutes of Health, the National Science Foundation, the Office of Naval Research, the Office of the Surgeon General, Department of the Army and Harry M. Stevens, Inc.

Neurological Surgery

J. LAWRENCE POOL, *Professor and Chairman of the Department
Director of Service*

Since this marks the end of ten years as Director of the Service of Neurological Surgery, this report will review the progress of the past decade. The volume of work has increased and the quality of patient care has improved, for example, by a significant and extremely gratifying drop in the surgical mortality rate for dangerous tumors like acoustic neurinomas and for ruptured intracranial aneurysms.

Expansion of the Service has included the construction of a third operating room, additional space gratefully assigned to members of the Service of Anesthesiology working so effectively with us and the rapid development of pediatric neurosurgery.

An idea of our present surgical load is given in table I.

The development of pediatric neurosurgery is indicated by a total of 106 operations during the past year alone, the majority of these being for brain tumors and hydrocephalus, in addition to diagnostic procedures including seventy-two pneumoencephalograms, forty-three ventriculograms, twenty-nine arteriograms and four myelograms. The Pediatric Special Care Unit, of six bed capacity, admitted a total of 233 patients with a daily average census of 5.2 patients. Investigative efforts have likewise flourished so that our present staff are now publishing over twenty-five papers on clinical and research topics a year as compared with one-tenth this number ten years ago. Much of this activity has been made possible through the many generous donors who have enabled us to establish and man two cramped but extremely active neurosurgical research laboratories, one directed by Professor James B. Campbell and the other by Professor Dominick P. Purpura. Subjects of investigation range from neurochemistry, cerebral vasospasm, the protective effects of hypothermia and the prevention of adverse central stimuli on cardiac action, to the innervation of the urinary bladder, improved methods of peripheral nerve and spinal cord regeneration and cen-

tral influences on lipid metabolism. It is of interest that most members of our Resident Staff are actively engaged in investigative efforts.

TABLE I
OPERATIONS JANUARY 1, 1959 THROUGH
DECEMBER 31, 1959

Brain Tumors	221
Disc Surgery	222
Trauma Surgery	53
Aneurysm Surgery	49
Pain Relief	46
Hydrocephalus	46
Spinal Tumors	53
Peripheral Nerve	59
Congenital lesions	21
Parkinson's Disease	16
Miscellaneous	218
	<hr/> 1,004
Ventriculograms and Angiograms	651
	<hr/> 1,655

With respect to recent improvements in patient care, it has been found that specially prepared urea for intravenous use has proved increasingly helpful during the past year for reducing brain volume during surgery as well as postoperatively, thus facilitating the surgical treatment of intracranial aneurysms and brain tumors. The application of hypothermia, moreover, has been extended from aneurysm surgery to its use during operations on tumors close to the hypothalamus such as large subfrontal meningiomas and cranio-pharyngiomas. Thus, the dangerous postoperative hyperthermic crises, formerly so frequent following these types of surgery, have been eliminated with an appreciable improvement in surgical results. Monitoring of cardiac activity during intracranial procedures has also proved so useful and informative that greater attention has been paid to this problem during the last year again with benefit.

There have been no changes in staff or organization with the exception that Dr. Thomas J

Bridges will devote more of his time to problems of pain relief and the like at the Francis Delafield Hospital where he has done such outstanding work. It should also be mentioned that Dr. Edgar M. Housepian, a recent Resident, has been appointed Instructor in Neurological Surgery and Assistant Neurological Surgeon in which capacities he is doing work with particular respect to the development of surgical and research techniques related to the treatment of Parkinson's Disease.

Staff Activities

Professor Pool has continued his interest in the early surgical treatment of ruptured intracranial aneurysms and studies of cerebral vasospasm. During the year, he attended the meeting of the American College of Surgeons (Puerto Rico Section) in San Juan, reported at the New York Neurological Society on advances in technical and training developments in neurosurgery; participated in the annual Houston Neurological Society meeting on vascular disorders of the brain; attended the Medical Advisory Committee meetings of the National Foundation and a recent Symposium on the Cardiovascular System sponsored by the National Research Council, Washington, D. C.

During 1959, Dr. Pool broadcast in French for the Voice of America and participated with Dr. Melvin D. Yahr, Professor of Clinical Neurology and Associate Attending Neurologist, in a radio broadcast for the Academy of Medicine on the early surgical treatment of intracranial aneurysms. He was elected for a three-year term as a member of the Board of Governors of the American College of Surgeons.

Both Dr. Scarff and Dr. Cramer worked diligently and most successfully for several months on the Committee for Planning the Fiftieth Anniversary of the Neurological Institute.

Dr. Byron Stookey, Professor Emeritus of Clinical Neurological Surgery, also deserves our lasting gratitude for initiating the Fiftieth Anniversary celebration. As mentioned elsewhere, Dr. Stookey was awarded an Honorary Degree on this occasion by Columbia University for his scientific and teaching contributions during a long and distinguished career at the Neurological Institute where he succeeded Dr. Charles A. Els-

berg as Director of the Service of Neurological Surgery.

Professor Edward B. Schlesinger has continued his investigative work in the field of radio-isotopes with improvement in recording instrumentation resulting in: the proven value of extracranial localization with gamma emitters as tested in a series of 104 cases; determination of the time characteristics of uptake for various lesions utilized to improve statistics and prognostication of lesion types, including localization of vascular lesions; a new method of testing ventriculopleural shunts by tracer substances and the comparison of intravenous with intrathecal tracer injections. The importance of improving the scanning speed and comparison of all brain areas has become obvious. Dr. Schlesinger has thus developed what appears to be an increasingly effective method of total brain scans which he hopes will gradually supersede his present method. This work has been mainly supported by the American Cancer Society with additional assistance from research gifts from private donors. During the year, Dr. Schlesinger was elected Vice President of The Neurosurgical Society of America.

Professor Lester A. Mount highlighted his year with a tour of Colombia, Chile, Argentina, Uruguay and Brazil where he lectured in Spanish on collateral circulation of the brain as demonstrated arteriographically, premature closure of sutures of the cranial vault, and the present treatment of intracranial aneurysms, vascular anomalies and subarachnoid hemorrhage and gave several lectures entitled "Life in the United States."

Professor Joseph Ransohoff has again participated in the cooperative study group concerning the treatment of glioblastoma multiforme with an evaluation of various methods of treatment. These studies have been done in collaboration with Dr. Alfred Gellhorn, Professor of Medicine and Associate Attending Physician, Dr. Juan M. Taveras, Professor of Radiology and Associate Attending Radiologist, Dr. Daniel Sciarra, Associate Professor of Clinical Neurology and Associate Attending Neurologist, Dr. James Malm, Instructor in Surgery and Assistant Attending Surgeon, and Dr. Richard B. Raynor, Assistant Resident.

Dr. Ransohoff has been engaged in a study of temporal lobe epilepsy with an evaluation of the psychological effects following temporal lobec-

tomy, with Dr. Eli S. Goldensohn, Assistant Professor of Neurology and Assistant Attending Neurologist and Dr. Shirley Ferguson, Research Associate in Neurology and Assistant Neurologist. He has carried on a five year review of ventriculopleural shunts with Dr. Robert A. Fishman, Assistant Professor of Neurology and Assistant Attending Neurologist, and Dr. Kenneth Shulman. Dr. Ransohoff has conducted studies concerning experimental rage in animals and the effects of drug therapy with Dr. Murray Glusman, Assistant Clinical Professor of Psychiatry and Associate Attending Psychiatrist in Vanderbilt Clinic. He has investigated the evaluation of hypothermia in massive midline neoplasms in children with Dr. Hubert L. Rosomoff, former Resident in Neurological Surgery. Dr. Ransohoff has participated in the National Aneurysm Study Group with Drs. Pool and Mount and Drs. Melvin D. Yahr and Dr. James F. Hammill of the Department of Neurology. A review of the etiology and treatment of hydrocephalus has been conducted with Drs. Fishman and Shulman. Dr. Ransohoff carried on a study of the electrical activity of the brain in patients treated with hemispherectomy or extensive decortication, with Dr. Goldensohn.

Dr. Thomas J. Bridges has been active in a research project on the effect of hypophysectomy on advanced breast cancer with Dr. Cushman D. Haagensen, Professor of Clinical Surgery. He is also engaged in research on carotid-jugular perfusion of tumor-bearing brain with chemotherapeutic agents, with Dr. James Malm of the Department of Surgery and Dr. Richard B. Raynor.

Dr. James W. Correll has continued investigation of the control exerted by the central nervous system on lipid metabolism with related neuroanatomical studies to identify hypothalamic-spinal cord pathways, with Dr. Malcolm B. Carpenter, Associate Professor of Anatomy and Assistant Attending Neurologist. The major support for this research work was provided by the Paul Moore Research Gift. With Dr. Carpenter and Dr. Alanson Hinman, Visiting Fellow in Neurology, Dr. Correll has made an investigation of spinal cord pathways important in experimental subthalamic hyperkinesia in the monkey. This study has shown that these abnormal movements can be abolished by interruption of the

lateral cortico-spinal tracts, but not by interruption of any other spinal pathways. This work has led to the hypothesis that the so-called "extrapyramidal motor system" is probably not a complete and independent motor system but a functional unit dependent upon the integrity of the cortico-spinal system.

Dr. James B. Campbell has carried out a study of the regenerative potential of the peripheral nervous system and spinal cord directed at improving clinical methods for peripheral nerve repair and alleviation of the paraplegic state, in cooperation with Dr. C. Andrew L. Bassett, Assistant Professor of Orthopedic Surgery and Assistant Attending Orthopedic Surgeon and William F. Windle, Ph.D., Chief of the Laboratory of Neuroanatomical Sciences of the National Institute of Neurological Diseases and Blindness of the National Institutes of Health. Although most of this study has been carried out here at the Medical School, portions of the project have been carried on at the National Institutes of Health where their facilities have graciously been made available to Dr. Campbell. Dr. Earl F. Feringa, U. S. Public Health Officer on temporary leave from Dr. Windle's Laboratory, has also been assigned to this study, as has Dr. Lloyd Guth and Dr. Karl Frank of the National Institutes of Health, and Dr. Lamar Soutter of the Boston University School of Medicine. Funds for this study have been contributed by the Department of the Army, Officer of the Surgeon General, Research and Development Division; National Institutes of Health and the United Cerebral Palsy Research and Educational Foundation, Inc.

Dr. Campbell is also continuing the development of an improved method for stereotaxic placement of radio-necrotizing agents in the brain of man designed to alleviate dyskinetic states, in collaboration with Dr. Harold H. Rossi, Associate Professor of Radiology, supported by the Department of Medicine and Surgery, Veterans Administration; the Quaker Oats Company; the Donner Foundation and the Mrs. Rodgers Denckla Research Gift.

Dr. Dominick P. Purpura's past year was devoted to a continuation and extension of previous studies on the pharmacology of amino acids and their derivatives, their structure-activity relations and the use of these compounds to explore the

composition of different cortical synaptic organizations. New data were obtained on the biochemical changes in experimentally-induced epileptogenic foci and normal cortex following systemic administration of various amino acids and N^{15} labeled NH_4 Acetate. In addition, studies were carried out on the morphological and biochemical changes induced by the antimetabolite of vitamin B_6 , methoxypyridoxine, the organization of intra-hippocampal synaptic pathways, the mode of action of cerebro-ponto-cerebellar projections to the paramedian lobule and the control of pyramidal and extrapyramidal pathways from cerebral cortex exerted by the diffusely-projecting systems of the thalamus. The physiology and pharmacology of the developing mammalian nervous system was studied in a large series of late fetal and newborn experimental animals. Information was obtained on some functional characteristics of the blood-brain barrier, the development of synaptic activities in the superficial cortical neuropil, hippocampus and a variety of thalamocortical pathways. Studies were also carried out on the nature of succinylcholine-induced contractures in newborn animals, the effects of methoxypyridoxine seizures and the responsiveness of different organizations in immature cortex to ω -amino acids. He has submitted twenty-two communications for publications during 1959.

Dr. Purpura's research projects have been supported by the National Institutes of Health, the Paul Moore Research Gift and the Sister Elizabeth Kenny Foundation.

Dr. Edgar M. Housepian has been active in basic research in neurophysiology designed to define the cortical elements involved in the discharging of cortico-spinal neurons by stimulation of different corticopetal pathways (the medial and lateral thalamus, midbrain and pontine reticular formation, and the cerebellum) in an effort to delineate pyramidal and extrapyramidal functions, in collaboration with Dr. Purpura. He has continued clinico-pathological studies in Parkinsonism and the dyskinesias by stereotaxic surgical procedures with Dr. Pool. Dr. Housepian has conducted studies on the correlation of the accuracy of stereotaxic surgery based on biopsy confirmation of target sites and clinical evaluations; and electrophysiological techniques in preliminary studies on the central effects of certain tremoro-

genic and anti-Parkinson drugs with observation of the effects of chronic administration of these agents to animals, with Drs. Pool and Purpura. These studies have been supported mostly by a post-doctoral research grant from the Parkinson's Disease Foundation and in part, by the Paul Moore Research Gift.

Resident Staff Research Activities

Dr. John N. Potanos, Resident in Neurological Surgery, was awarded the degree of Doctor of Medical Science for work in biochemistry with tagged carbon atoms. His current research includes: preliminary investigations in adaptation of autoradiographic cytochemical techniques to central nervous system tissues, and further investigations in delineation of mechanisms of " C_1 " metabolism in neural tissues by the use of radioisotopic tracer techniques, in association with Dr. Samuel Graff, Professor of Biochemistry, and Dr. Aaron Freedman, Assistant Professor of Medicine (Biochemistry).

Dr. David A. Miles has been granted a one-year leave of absence for study in the Department of Biochemistry. Dr. John Litvak has studied the experimental gradual arterial occlusions with *in vitro* and *in vivo* observations. Dr. Thomas M. Fletcher has completed a study with Drs. Pool and Taveras on cerebral vasospasm in angiography for intracranial aneurysms. Dr. Charles M. Simpson and Dr. Arnold Schoolman are studying the localization of temporal lobe lesions with a new recording technique.

Dr. Richard B. Raynor has worked on the delayed effects of hypothermia on experimental brain injury in dogs with Dr. Shulman and Dr. David W. Grainger, Intern in Surgery; the effects of hypaque on cerebral vasospasm with Dr. Gerald Ross; evaluation of Serotonin as an etiologic agent in cerebral vasospasm, with Drs. Pool and James G. McMurtry; extra-corporeal circulation-perfusion techniques developed for the treatment of malignant brain tumors, with Drs. Ransohoff and Malm; a study of the brain uptake and toxicity in dogs of atabrine, an anti-tumor agent, with Dr. Ransohoff, Dr. Erich Hirschberg, Assistant Professor of Biochemistry (Medicine), and Dr. Alfred Gellhorn, Professor of Medicine; and a clinical study of patients with uremia and papilledema without hypertension.

Dr. Kenneth Shulman has participated with Dr. Rosomoff in a review of patients in whom ethylene diamine (anorganic) bone has been used and has worked on the preparation of experimental hydrocephalic animals. Dr. Gerald Ross has conducted a clinical evaluation, with Dr. Arnold Gold, Visiting Fellow (American) in Neurology, of lowering elevated cerebrospinal fluid pressures in suspected cases of pseudotumor cerebri with intravenous urea, followed by pneumoencephalography as an alternative procedure to ventriculography; and has studied the effects of intra-arterial injections of hypaque on the cerebral blood vessels of cats by photographing the vessels, with Dr. Raynor. In addition, he has evaluated the use of plastic tubing as shunts in blood vessels with a view to their possible use in the surgical treatment of cerebral aneurysms, with Dr. Bernard Perlman, Bronx Veterans Administration Hospital, New York.

Dr. James G. McMurtry has carried out studies with Drs. Pool and Raynor, of cerebral vasospasm including experimental attempts to produce, relieve and prevent this phenomenon. With Dr. Correll, Dr. McMurtry is evaluating the altered lipid response to the intravenous action of Tween 80 in rabbits with stereotaxic lesions in the hypothalamus. Experiments, thus far, suggest

an alteration in serum levels to intravenous Tween 80 in animals with high thoracic or bilateral hypothalamic lesions. This part of his work has been supported by the Paul Moore Research Gift.

Needs of the service include a postoperative recovery unit on the ninth floor of the Neurological Institute for adults with an adjacent section for children. Plans for this and a few additional beds for semi-private patients on the ninth floor have been completed.

It is of interest to note that the Neurological Institute of New York celebrated the Fiftieth Anniversary of its founding with a meeting of the Society of Neurological Surgeons at the Neurological Institute for which Dr. Byron Stookey, Dr. John E. Scarff and Dr. Pool were hosts. In addition, the Neurological Institute Alumni Association met here in honor of the Fiftieth Anniversary, at which Columbia University awarded Professor Stookey an honorary degree.

During the year a large number of visitors from foreign countries as well as from clinics in this country have visited us, some as observers for a period of weeks or months.

The cooperation of the Services and Departments, particularly those of Nursing and Neurology, is most warmly and gratefully acknowledged.

Neurology

H. HOUSTON MERRITT, *Professor and Chairman of the Department
Director of Service*

There were no significant changes in the teaching activities of the Department of Neurology or in the clinical activities of the Service of Neurology. The department is still working under the handicap of lack of space to carry on its research activities. The initiation of many important projects has been delayed and the progress of projects previously started, has been impeded. The clinical work at the Neurological Institute continued at its previous high level despite the handicaps occasioned by the construction work.

The Neurological Institute celebrated the Fiftieth Anniversary of its founding in June, 1959. In addition to scientific exercises, there was an academic convocation at which honorary degrees were awarded to Dr. Henry A. Riley and Dr. Byron Stookey.

We report with deep regret the deaths of Dr. Richard M. Brickner and Dr. Edwin G. Zabriskie. Dr. Brickner served the department faithfully for over twenty-five years. Dr. Zabriskie joined the staff of the Neurological Institute shortly after its founding, fifty years ago. He was one of the most influential of the group of neurologists who brought the Neurological Institute to its present state of eminence. For twenty-three years, until the time of Dr. Zabriskie's retirement in 1948, he was Professor of Clinical Neurology, Visiting Neurologist from 1946-1947, and Acting Director of the Institute. He was awarded the Medal of Honor at the Twenty-Fifth Anniversary of the founding of the Medical Center. He was beloved by all of his colleagues and it was their greatest regret that he did not live to participate in the celebration of the Fiftieth Anniversary of the founding of the Neurological Institute.

The electroencephalographic laboratories at the Neurological Institute and in the Presbyterian Hospital continue to carry a large clinical load. In addition, the workers in these laboratories have conducted a number of research studies. Professor Paul F. A. Hoefer has continued his studies of the clinical and electroencephalographic

findings in diffuse encephalopathies. Professor Hoefer and Professor Frederick A. Mettler are studying the electroencephalogram in partially decorticated monkeys under anesthesia and in anoxia during curarization.

Mr. Henry Zablow, with Professor Eli S. Goldensohn, has continued to work on the electrical impedance plethysmograph. With Professor Hoefer, he is working out a technique for stimulation of and recording from single fibers in intact muscle *in situ*. He has also done preliminary theoretical work on the possibility of determining the location of EEG generators from the potential distribution of the scalp. With Dr. Rita Guttman of the Department of Biology, Brooklyn College, Mr. Zablow has published a study on: Membrane Resistance and Rectification of Muscle Stimulated by Rapid Cooling.

Professors Hoefer, Lewis P. Rowland and Henry Aranow, Jr. continue their studies of the causation, pathology and therapy of myasthenia gravis.

Professor Goldensohn and Dr. Arnold P. Gold reported a study on prolonged behavioral changes which occur as manifestations of epilepsy, at the annual meeting of the American Academy of Neurology. As a contribution to the Festschrift in honor of President A. Marchionini's sixtieth birthday, Professor Helen O. Curth, Assistant Professor of Dermatology and Assistant Attending Dermatologist, and Professor Goldensohn, reported on the significance of facial nevi in the midline as a variant of the Sturge-Weber syndrome and as indications of intracranial vascular malformations. Professor Goldensohn continues his studies in electromyography. He contributed a chapter on this subject to a book by Dr. L. Laszlo Schwartz, Clinical Professor of Dentistry and Assistant Attending Dental Surgeon, on "Disorders of the Temporomandibular Joint."

Professor Goldensohn and Dr. Joseph Ransohoff, Associate Professor of Clinical Neurological Surgery and Associate Attending Neuro-

logical Surgeon, and Dr. Shirley Ferguson in association with Dr. J. Lawrence Pool, Professor of Neurological Surgery and Director of the Service, Professor Melvin D. Yahr, Dr. Virginia N. Wilking, Associate in Psychiatry and Assistant Pediatrician, Mr. Kalman Rabinowitz and Mr. Adam Munz, psychometrist at the Presbyterian Hospital, are investigating the effects on behavior and personality in patients treated by temporal lobectomy for intractable seizures of temporal lobe origin. Professor Goldensohn and Dr. William K. Hass have completed their work on electroencephalographic changes associated with internal carotid thrombosis and are continuing studies on the effect of body tilting in cardiovascular disorders which compromise circulation to the brain. Professor Goldensohn and Dr. Alan Hinman are studying the effects of adrenal corticoids on children with infantile spasms associated with characteristic electroencephalographic abnormalities. Professor Goldensohn and Dr. Miriam Carmichael are investigating new methods for screening anticonvulsant compounds in experimental animals. Professors Goldensohn, Sidney Carter, James F. Hammill, William Amols and Melvin D. Yahr and Dr. Carmichael are continuing the clinical evaluation of a number of new anticonvulsant compounds in the Seizure Clinic.

The activities of the neurological service in Babies Hospital continue to increase. During the year, 414 patients were admitted to the inpatient service and an average of twelve new and forty old cases were seen in the outpatient department each week. Under the guidance of Professors Carter and Hammill, six Fellows received training in pediatric neurology. Professor Carter and Dr. Stuart Weiss made a study of acute cerebellar ataxia in children. Professors Carter, Ransohoff and Dr. Harold Haft of the Department of Neurological Surgery, completed their study of tumors of the spinal cord in childhood. Professors Carter, Ransohoff and Hammill are evaluating the course and treatment of brain tumors in children. Professor Carter and Dr. Gold are studying the effects of intravenous administration of urca on increased intracranial pressure.

Professor Yahr is studying the effects of the administration of dilantin on trigeminal neuralgia.

Professors Yahr, Robert A. Fishman and Dr. Martin Triedman are correlating the blood levels of dilantin with the therapeutic action of this drug in patients with epilepsy.

Professor Hammill continues the study of the treatment of cerebral aneurysms with other members of the neurological and neurological surgery services. Professors Hammill and Carter continue their participation with other services in the National Cooperative Study of the perinatal factors in the development of cerebral palsy.

Professor Rowland is studying the metabolism of delta-aminolevulinic acid and a possible enzymatic defect in acute intermittent porphyria. Professor Rowland is also studying endocrine function in myotonic muscular dystrophy with Dr. Nicholas P. Christy, Associate in Medicine and Assistant Physician, Dr. Kenneth Sterling, Research Associate in Psychiatry and Assistant Physician, and Dr. Melvin Grumbach, Assistant Professor of Pediatrics and Assistant Attending Pediatrician. Professor Rowland is also following the study of enzymatic activity in serum and urine of patients with various myopathies with Dr. Erich Hirschberg, Assistant Professor of Biochemistry.

Professor Fishman with Dr. Christy, is investigating the exchange of steroids between plasma and cerebrospinal fluid. Professor Fishman is also studying the amino acid pattern in normal cerebrospinal fluid and the relationship of the magnesium level in plasma and cerebrospinal fluid in various neurological disorders.

The major activities of the immunochemical laboratories under Professor Elvin A. Kabat involve a study of the antigenicity of polysaccharides in man, the structural basis of immunochemical specificity, the elucidation of the structure of the blood group A and B substances, the studies of gamma globulins in spinal fluid and serum.

Dr. Irving Finger, Assistant Professor at Haverford College, and Professor Kabat published their study of the antibody response to anamnestic stimulation of Schick negative individuals with diphtheria toxoid. All individuals showed detectable antibody formation to numerous impurities present in the diphtheria toxoid in addition to a rise in antitoxin. Dr. Finger, Professor Kabat, Miss Ada E. Bezer and Mrs. Amy Kidd

of Professor Kabat's laboratory, have been studying the behavior in agar diffusion of antidextran sera with dextrans of varying molecular weight.

Professor Yahr, Mrs. Kidd and Professor Kabat are continuing their study of gamma globulin in cerebrospinal fluid.

Dr. Joel W. Goodman, a graduate student, completed his study of the cross reactions of dextrans with Types II, XX, IX and XII antipneumococcal sera. The data established that terminal non-reducing chains of five α 1,6 linked glucose residues could fit into the Type II combining site of horse and rabbit Type II antipneumococcal sera. Dr. Peter Z. Allen, now a National Research Council Fellow at the Lister Institute, London, England and Professor Kabat have found that individuals immunized with dextrans with high proportions of α 1,3 and α 1,2 linked glucoses, produce antibody with specificities directed against either α 1,3 or α 1,2 linked glucoses. Extending their studies to cross reactions of these and other dextrans with Types IX and XII antipneumococcal sera, Dr. Goodman and Professor Kabat have shown that α 1,4 and α 1,3 linked glucoses are important in the former, while α 1,2 linked glucoses were important in the latter cross reaction.

Dr. Gerald Schiffman, Professor Calderon Howe, Associate Professor of Microbiology, Miss Bezer and Professor Kabat published extensive studies of the role of enzymes from *Clostridium tertium* in destroying the cross reactivity of blood group substances with Type XIV antipneumococcal sera in the Journal of the American Chemical Society.

Dr. Schiffman, Professor Kabat and Dr. Sidney Leskowitz, now Research Associate at the Massachusetts General Hospital, Boston, Massachusetts, have isolated five oligosaccharides by mild acid hydrolysis, dialysis and chromatography of a blood group B substance from a pseudomucinous ovarian cyst. Two of the oligosaccharides are fucosylgalactose, one definitely and one probably linked 1,6 and one is a fucosyl fucose, another a (fucosyl, galactosyl)-N-acetylglucosamine and the fifth a difucosyl, N-acetylglucosamine. None of these oligosaccharides appears to represent the oligosaccharide side chain determining B activity.

Dr. Allen and Professor Kabat have completed

their study of the properties of the non-dialysable PI fraction of blood group A and B substances. These materials were antigenic even in humans of the same blood group as that from which the PI fractions were obtained and gave rise to antibody specific for groupings inside of the blood group molecule which were exposed by mild acid hydrolysis.

Dr. Maria L. Zarnitz, from the University of Freiburg, Germany has spent a year with Professor Kabat as a Rockefeller Foundation Fellow. She is studying the cross reactions of various lactosyl and melibiosyl-phenyl-azo-proteins with Type XIV antipneumococcal sera with a view to elucidating the structural requirements for cross reactions of various polysaccharides with Type XIV antisera. She is also engaged in a study of effects of various enzymes on blood group substances.

Mrs. Rose Mage, a graduate student in Microbiology, is working with Professor Kabat on a study of the sizes of the oligosaccharide units determining reactivity of the Type III and VIII pneumococcal polysaccharides with their homologous antisera.

Professor Kabat attended the VII International Congress of Microbiology at Stockholm in July, 1958, and presented a paper with Miss Bezer on "The Antigenicity of Dextran Fractions of Varying Molecular Weight." He was also invited to attend the Third International Congress of Allergology in Paris in October, 1958, at which he presented a paper entitled "Problems in the Study of Allergic Antibodies" in a symposium on Allergic Antibodies. He will be spending a sabbatical year at the Institut Pasteur in Paris writing the second edition of "Experimental Immunochemistry."

Professors Mettler and Hoefler have been engaged in the effort to establish the morphologic substrate necessary for the appearance of "periodic bursts" in the electroencephalogram and with Professor William F. Caveness, have been engaged in an effort to extend to the primate the findings of Dr. Samuel P. Hicks of Boston with regard to nitrogen asphyxia in the rat. During this period Professor Mettler reported upon phenomena of functional recovery in monkeys with large spinal cord lesions. This study led to a further investigation of the course of the pupillo-

dilator fibers within the upper cervical segments of the spinal cord.

Professor Mettler has extended to primates his findings in carnivores that the striatum is concerned with the ability of the organism to relate itself to its environment. In the monkey, as in the cat, it has become apparent that the assumption that higher neural activity is a function restricted to the cerebral cortex, is too restrictive. It has now been repeatedly demonstrated that ablation of increasing amounts of striatal tissue produces a proportional degree of impairment, or loss, of previously established somatomotor (motor defense) conditioned reflexes. It is of importance to point out that although striatal damage interferes with instrumental behavior, it does not abolish the effective component of conditioning. Dr. Robert Thompson has collaborated with Professor Mettler in his work and they have been assisted by Mr. William Ayers, Mr. Douglas Ramsay and Mr. Arnold Hyman.

Studies on the fundamental nature of bioelectric potentials are continuing in the laboratory of neurophysiology. The theory that they may be divided into two categories, depending upon whether or not the processes are initiated by electrical stimuli has been extensively documented and is widely adopted. Except in a few special cases, reception of information at sensory endings, and its transmission from cell to cell involve electrically inexcitable processes. Inhibitory synaptic activity, like that of the excitatory synapses, belongs to this category. Propagation of impulses within a cell is electrically excitable. Professor Harry Grundfest's application of the theory to account for the electrophysiology of photoreception has recently been confirmed in the horseshoe crab. A similar application to mechanoreception has been verified for cat pacinian corpuscles by Professor Werner R. Loewenstein, Assistant Professor of Physiology.

The interrelations of the two kinds of bioelectric activity give rise to various degrees of complexity. One that is common to many invertebrate neuromuscular systems was analyzed by Professor Grundfest with Drs. Jean Cerf (Brussels), Graham Hoyle (Glasgow), and Frances V. McCann of Dartmouth College. Further work, with Dr. Robert Werman has shown how one ingredient of this complexity, graded electrically

excitable responsiveness of the muscle fibers, is produced and how it may be converted to all-or-none activity. Other features have also been studied with Dr. Werman and Dr. John P. Reuben. Further work on the pharmacology of lobster neuromuscular synapses with Dr. Reuben and Professor Felix Bergmann, Visiting Professor from Jerusalem, has uncovered a series of drugs which preferentially affect the presynaptic nerve terminals.

An exceptional system, in which transmission is electrical (ephaptic), is that of septate giant axons of worms and crustaceans. Earlier work has now been extended by Professor Grundfest with Dr. Akira Watanabe and Mr. Thomas G. Smith, one of our medical students. Professor Michael V. L. Bennett has discovered in the supramedullary cell cluster of Puffer, a functional ephaptic system among vertebrates.

Studies on electric fish by Professors Bennett and Grundfest have continued, in part with Drs. Richard D. Keynes of Cambridge and Menachem Wurzel of Jerusalem. Representative forms in six of the seven known families of electric fish have now been examined with modern methods. Many varieties of bioelectric activity occur in these forms, and the range of theoretically important problems exposed by this work is therefore large.

Studies on the embryology and morphology of electric fishes, paralleling the physiological and pharmacological work, are being carried out by Mr. Robert Mathewson of the Staten Island Institute of Arts and Sciences and Mr. Alan Wachtel of the Mt. Sinai Hospital. Combination of histochemical with electronmicroscopic techniques has shown that esterase activity is concentrated at synaptic regions and is not seen at uninnervated regions of the electroplaque surface. The pattern of fine structures revealed by electronmicroscopy is similar in all electroplaques.

Earlier studies on electrophysiology and pharmacology of bullfrog neuraxis are being extended by Professor Grundfest and Dr. Vladimir I. Skok, Kiev State University.

Professor Grundfest and Dr. Dominick P. Purpura, Associate Professor of Neurological Surgery, have continued their collaborative studies on the nature of various electrocortical activities. Their discovery and analysis of the synaptic ac-

tions of ω -amino acids and related compounds is not only of theoretical importance, but has also provided new tools for further studies. With Dr. Martin Girado, he has been able to specify the bioelectric components of a number of responses evoked in different cerebellar regions by various stimuli. Electrophysiological and pharmacological analyses of other systems are in progress.

Drs. Joseph E. Fiasconaro and Harold Sherman, both Assistant Clinical Professors of Dentistry, are studying with Professor Grundfest the effects of relatively weak analgesic agents, including acetylsalicylic acid, in human subjects.

Professor Grundfest lectured in 1959 at Basel, Cambridge and London Universities and at the Salpêtrière and the Sorbonne in Paris. He also gave a series of lectures at the Czechoslovak Academy of Sciences and the Charles University in Prague, and at the Nencki Institute for Experimental Biology and the University of Warsaw.

Professor Grundfest was one of the organizers of the Symposium on Comparative Bioelectrogenesis in Rio de Janeiro. It was sponsored by the Brazilian Academy of Sciences, University of Brazil, UNESCO and the Air Force Research and Development Branch. Professors Bennett and Grundfest, Dr. Keynes and Mr. Mathewson, each presented papers on work from the Laboratory of Neurophysiology.

The neurochemistry section of the department continued under the direction of Professor David Nachmansohn its research on the chemical and molecular basis of nerve activity.

Among the important achievements of the last year was the successful isolation and identification of the acetylcholine receptor protein by Dr. Seymour Ehrenpreis. During the last two years Dr. Ehrenpreis succeeded in isolating a specific protein from electric tissue which shows strong binding to acetylcholine and its analogues. The binding strength of a large series of tertiary and mono- and diquaternary analogues of acetylcholine to this protein was determined by equilibrium dialysis. By comparing the binding strength of the series of compounds used with their effectiveness on electrical activity of the isolated single electroplax, identification became possible. The specificity of interaction of the various compounds to the protein was ascertained in other ways. Electrophoretic analysis shows that the

protein consists of only one component.

The node of Ranvier has proven to be a useful tool for testing the effect of chemical compounds on axonal conduction. The preparation has the unique feature in that the conducting membrane at the Ranvier node is covered by only a very thin and possibly porous structure. Dr. Wolf Dettbarn has found it to be the most sensitive preparation for testing compounds reacting specifically with the acetylcholine system of the axonal membrane. Their action at that point was found to be quite comparable to that on the synaptic membrane. The results of Dr. Dettbarn's studies have confirmed the viewpoint that the properties of synaptic and axonal membranes are basically similar and that the acetylcholine system plays the same role in the axonal membrane as in the nerve terminal and the postsynaptic membrane.

Dr. Francis C. G. Hoskin has shown, with the aid of radioactive substrates, that the electric tissue of electric eel utilizes an alternate pathway in the metabolism of glucose in addition to the well known Myerhof-Embden route, in contrast to brain which uses the latter exclusively. However, with special inhibitors, as, for instance, the arsenite ion, the brain can be made to utilize an alternate pathway. This may also be achieved by vitamin K_3 which produced a several fold stimulation of the metabolism of glucose-1-phosphate.

Dr. Claire Lawler has made significant progress in elucidating various properties and characteristics of the enzyme acetylcholinesterase. The turnover time is very small, of the order of a few microseconds. This is of basic importance for any assumption that acetylcholine plays a role in the generation of bioelectricity. The number of active sites per enzyme molecule is under study.

The laboratory had two visitors from abroad Dr. Ronald Whittam from the laboratory of Sir Hans Krebs, Oxford, England and Dr. Maxime Guinnebault from Saclay, the new Research Center of the Atomic Energy Commission of France. Both made most valuable contributions to the vast problem of ion flux across conducting membranes, using the single isolated electroplax.

Dr. Allen Gold, using alkylphosphates as a tool, is investigating the active site of acetylcholinesterase as to geometry, location of certain

atoms and amino groups, thus continuing the interesting work initiated by Professor Irwin B. Wilson. Dr. Ladislav P. Hinterbuchner applied a powerful reactivator of phosphorylated acetylcholinesterase to alkylphosphate poisoned muscles. The complete and irreversibly abolished electric activity of the fiber was partially and, in some cases, completely restored.

A neurochemistry training program has been initiated jointly with the Department of Biochemistry and supported by the United States Public Health Service. Four trainees participated in the program.

Professor Nachmansohn summarized the results of the investigations of his laboratory over a period of twenty-four years in a monograph "Chemical and Molecular Basis of Nerve Activity" which was published in September 1959. He also organized two International Symposia in the Fall of 1958. One symposium, organized jointly with Professor Detlev W. Bronk, President of the Rockefeller Institute, was concerned with the molecular biology of nerve and muscle and was supported by the National Science Foundation. Among the participants were Peter Debye, A. V. Hill, Lord Adrian, Sir Hans Krebs, Sir John Eccles, Ernst Chain, Fritz Lippmann, Severo Ochoa and Henry Eyring.

Professor Wilson and his group continued studies of enzyme mechanisms. Dr. Leon T. Kremzner worked on the purification of mammalian histidine decarboxylase. This enzyme which produces histamine, has not previously been significantly purified and so its properties are unknown. Carbamyl derivatives of cholinesterase are being studied. These derivatives are important in the treatment of myasthenia gravis. Thermodynamic quantities of phosphoryl derivatives of cholinesterase are being measured. Mammalian phosphorylase is being studied in collaboration with Dr. John Menkes. It is hoped that these studies will be of value in relationship to glycogen storage disease.

Dr. Sara Ginsburg prepared a number of new organic compounds which are of special interest in theoretical work.

Professor Wilson received the Annual Award of the Association for Research in Nervous and Mental Disease. He lectured before the joint session of the Federated Society of Experimental

Biologists and at several medical schools and universities. The group participated in the neurochemistry training program.

Dr. William Amols has continued clinical testing of skeletal muscle relaxants, "psychic energizers" and anti-emetics.

Dr. William F. Caveness, with Dr. Kai C. Nielsen, has continued the study of head injury under the auspices of the Office of Naval Research. Attention has been directed to a more exact correlation of type and degree of brain involvement with type and degree of sequelae. A report with Dr. Henry R. Liss, former Chief Resident in Neurosurgery, on the incidence of posttraumatic epilepsy has been completed. Dr. Caveness also contributed two chapters on posttraumatic epilepsy for the Army Surgeon General's forthcoming volume on craniocerebral trauma in the Korean War.

Dr. Caveness in association with Dr. Nielsen and Mr. Walter M. Alleyne has continued the investigation of the development of the central nervous system in the Rhesus Macaque monkey. Serial electroencephalograms have been obtained from birth to puberty. At successive age levels generalized seizures have been induced by CO₂ and by metrazol. Similarly, focal seizures have been induced by injection of penicillin into the cerebral cortex. The developmental changes in these reactions are to be correlated with a parallel study of anatomical changes being carried out by Dr. Raymond D. Adams and Dr. Paul I. Yakovlev at the Harvard Medical School.

Dr. Caveness collaborated with Dr. George Gallup, Director of the American Institute of Public Opinion, in a survey of public attitudes toward epilepsy. The trends in these attitudes were made evident by comparison with similar polls conducted in 1954 and 1949.

During the academic year of 1958-1959, The Division of Neuropathology under Professor Abner Wolf examined 495 brains removed at necropsy from the Neurological Institute and Babies Hospital and studied 773 neurosurgical biopsies.

The training program in neuropathology carried on under a grant from the National Institute of Neurological Diseases and Blindness of the National Institutes of Health, was continued with Dr. Rosa E. Fiol-Rodriguez as Senior Trainee. Dr. Fiol-Rodriguez joined the School of Tropical

Medicine in Puerto Rico as Associate in Neuropathology on July 1, 1959. Dr. Joo Ho Sung continued his training and has become the Senior Trainee and an Associate in Neuropathology. Dr. Haruo Okazaki spent a year in training in the Division of Neuropathology and has returned to the New York State University as Instructor in Neuropathology. Dr. Paul Anderson spent a year in training and returned to the Mt. Sinai Hospital in New York as Neuropathologist. Dr. Sheila Donahue has continued her work in electronmicroscopy of the central nervous system and her training in neuropathology. She is an Associate in Neuropathology in the Division.

The investigations on perinatal pathology of the central nervous system by Professors Wolf, David Cowen and Dr. Lester M. Geller have continued. A report on perinatal infections of the nervous system by Professors Wolf and Cowen has just appeared. With Dr. John Potonos, Resident in Neurological Surgery, Professors Wolf and Cowen have published their findings on the reaction of glial tetrazolium and its significance for the metabolic activity of these cells. Dr. Geller published his findings on the failure of nicotine to affect development of offspring when administered to pregnant rats. With Drs. Hans Kaunitz and Charles Slanetz, Curator of Animal Husbandry, and Miss Ruth Johnson, he is reporting on some consequences of long-term ingestion of freely chosen 1% salt solution in the rat. With Professors Wolf and Cowen, Dr. Geller is preparing a report on the electrical properties of tissues during experimentally induced convulsions. A report of the effects of 6 amino-nicotinamide on the central nervous system of the mature rat by Professors Wolf, Cowen and Dr. Geller is in press and a more extensive report is in preparation. The effects on 6 AN on the nervous system of the neonatal rat is in progress. With Dr. Potonos, Professors Wolf, Cowen and Dr. Geller are planning to continue their study of closed-head electrocoagulation of the brain in the neonatal rat and its effects by autoradiography. Dr. Sung is continuing his study of late effects of radiation on the rat and human brain. Dr. Donahue has begun an electronmicroscopic study of the neonatal rat brain.

Professor Tiffany Lawyer, Jr., at the Montefiore Hospital, has been investigating the treat-

ment of occlusive vascular disease with anticoagulant agents and has been evaluating conservative and surgical treatment of subarachnoid hemorrhage due to ruptured intracranial aneurysm.

Professor Arnold P. Friedman has undertaken a broad investigation designed to determine if any of the known neurohumeral agents are concerned in the production of migraine. Professor Friedman has been initially concerned with the effect of serotonin (5-hydroxytryptamine) on migraine patients. Professor Friedman also has been investigating possible relationships between urinary amino acids and migraine. He has continued the evaluation of various pharmacologic agents for the treatment of headache.

Professor Seymour Solomon has been investigating the value in carotid artery disease of carotid compression with electroencephalographic and electrocardiographic controls. He has been concerned as well with the relationship of catalepsy to familial periodic paralysis.

Dr. Kevin D. Barron has been involved in the investigation of carcinomatous neuropathy and neuromyositis.

Professor Carter was elected a Trustee of the American Academy of Neurology and a Member of the Council of the American Epilepsy Association. He has continued to serve as Director of the American Board of Psychiatry and Neurology and Chairman of the Professional Advisory Council of the United Cerebral Palsy Association.

Professor Yahr was appointed a member of the Neurological Study Section of the National Institutes of Health, and Chairman of the American Medical Association's Committee on Neurological Disorders in Industry. He was also elected Secretary of the American Neurological Association and continues to serve as Medical Director of the Parkinson's Disease Foundation.

Professor Wolf has been appointed to the Board of Councillors of the National Institute of Neurological Diseases and Blindness and continues to serve as a member of the Training Grant Committee of this Institute.

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pany, Hoffman La-Roche, Inc., Eli Lilly & Company, E. R. Squibb and Sons, McNeil Laboratories; Parke, Davis & Company, Riker Laboratories, Inc., Sharpe and Dohme (Division of Merck and Co., Inc.), Smith Kline and French Laboratories, Warner-Chilcott Laboratories and Wallace Laboratories.

Nursing

ELEANOR LEE, *Professor and Chairman of the Department
Director of Service*

Undergraduate Program

The high enrollment for the past four years, averaging 370, shows an increase of eighteen per cent over the registration figure (305) for 1949. It is anticipated that due to the increased enrollment in colleges and universities the number of acceptable applicants for nursing will increase in the next few years to a capacity of approximately 390 students for the department.

In September, 1958, the 129 entering candidates came from twelve states and sixty-seven colleges as compared with 127 students entered in September, 1959, from eighteen states and sixty-eight colleges. Since September, 1954, all students admitted to the school have completed sixty credits in liberal arts before entrance to the nursing program. The Class of 1959 is the first graduating class to complete all the requirements for the Bachelor of Science degree by June first. The change from September to June was effective also for the classes of 1957 and 1958, who completed their nursing programs on June 30th and June 15th respectively.

Curriculum development is the constant concern of all members of the faculty. The responsibility for promoting, guiding and evaluating this development is the major responsibility of the basic curriculum committee. The initial division of the faculty into groups for curriculum study corresponds to the level of students learning. This enables all faculty members concerned with the student during a particular stage of her learning to work together for curriculum improvement. This year, these committees concentrated on an intensive study of content, method of teaching and evaluation.

During this year, all courses in the nursing program were studied by the faculty groups concerned to ascertain the kinds of learning experiences provided and their relationship to the objectives of the program for each year and the needs of the students.

In addition to the continuous study of cur-

riculum, four major forces have also affected the direction of the curriculum. They are the shortening of the program to thirty-two months and the inclusion of public health field practice for all third year students; completion of the study of teaching in the medical and surgical clinical field which was published in July, 1958, under the title "Nursing Student Responses to the Clinical Field"; an on-going study of mental health and psychiatric nursing in the basic curriculum and a public health nursing research project.

The first year program in medical and surgical nursing was completed May 24th by one hundred and twenty students. Two new units were included in the teaching. The first was the development and organization of human behavior given by Dr. Robert A. Senescu and Dr. Bernard Schoenberg. Patients interviewed in class were selected from the same general medical and surgical services on which the students had their first experiences in caring for patients. Group discussions planned by Mrs. Bertha Unger, Mental Health Project Instructor, and the first year nursing instructors followed each presentation. Thus the student had an opportunity to gain understanding of the meaning of illness and hospitalization and to learn how to help patients through these experiences. The second new unit, given by Mrs. Unger, provided a sound theoretical base in communications as related to professional nursing, including discussion of skills inherent in nursing care, such as interviewing, listening, observing and recording.

In the Spring semester, the course in medical and surgical nursing included content related to principles of teaching and learning. Recognizing that teaching is an integral part of all nursing care, this content was given earlier than in previous years. The ward conferences, organized as patient care conferences on each of the four teaching services, general medical and surgical, continued the same as last year, with a modification of scheduling and an expansion of membership

to include the instructor-supervisor in the clinical setting and a sociologist to act as participating-observer. Four psychiatrists and four sociologists participated in these conferences; each continued with the same instructor-student group throughout. The interest, support and cooperation of these specialists is invaluable. In September, 1959, the two courses on organization and development of human behavior and communication in nursing, along with patient care conferences were combined into one sixty-hour course. Psychosocial aspects of patient care continued throughout the first year as an integral part of the course in medical and surgical nursing.

A new plan of clinical supervision on the four teaching services, general and surgical, was established in September, 1958. It provided one instructor for the supervision of six students in the practice of nursing care of patients. Assignments are planned with the head nurse; following each three hour period of patient care, an hour conference of this same group is held by the instructor for discussion of experiences.

Two faculty seminars were held weekly during the Spring semester: for the first year faculty conducted by Dr. Schoenberg, and for the second and third year faculty under the leadership of the Mental Health project staff. The focus in these seminars is the students and the learning process. The continuation and expansion of the seminars was at the request of the faculty.

The cooperation of Dr. Lawrence C. Kolb, Professor of Psychiatry and Director of the Service, in arranging the generous amount of psychiatric conference time for the seminars and patient care discussions, is very much appreciated. The contribution made by Dr. Senescu during the first three years of the mental health project has been recorded in the progress reports. Dr. William Watson was designated by Dr. Kolb in the Spring of 1959 to work with the nursing faculty in the mental health project. In September, 1959, Miss Betty Jones succeeded Miss Anne McQuade as project director. Dr. Morris Zelditch, Jr., Social Scientist on Dr. Kolb's staff, has worked with the faculty in nursing on several projects including both mental health study and public health nursing research.

In the Fall of 1959, the second year program was expanded through the integration of mental

health. The mental health staff and instructors in pediatric nursing are focusing on strengthening the teaching of the growth process in pediatric nursing. Weekly seminars are held with the administrative and teaching staff of Obstetrical and Gynecological Service under the leadership of Dr. Watson and Miss Jones.

Changes of curriculum in the twelve weeks maternity nursing course given to the four groups of thirty students during this year, have shown good results. During the first four weeks, students are oriented to total maternity care through learning experiences in each unit: ante partal, labor and delivery, post partal and newborn. Two of the most important skills in maternity nursing have come with the changing trends in maternity care — teaching and emotional support. Nursing care is now taught through patient-centered conferences with discussion of nursing care plans for mothers and babies for whom students are caring. Students have experience with rooming-in with emphasis on teaching plans according to individual needs.

The second year program included a course in introduction to social work given in 1958-59 to four groups of students during the twelve weeks medical and surgical nursing. Miss Barbara Judkins, Assistant Professor of Medical Social Work, participated in a study by the second year faculty which resulted this year in the integration of the social care work content throughout the curriculum.

The current area of study in the curriculum of the third year has been public health nursing so that accreditation of the curriculum offered by the Department of Nursing will include accreditation for public health nursing. Dr. Ray E. Trussell, DeLamar Professor of Administrative Medicine and Chairman of the School of Public Health and Administrative Medicine, and Dr. Margaret W. Barnard, Associate Professor of Public Health Practice, have been most interested and helpful. Two part-time faculty members have taught public health administration to several groups. Two major tasks were accomplished this year: the development of a public health faculty for the department and the offering of required theoretical content in public health courses, public health administration and public health nursing. The placement of all students in the Class of

1959 for field practice ranging from four to eight weeks was similar to the plan for the Class of 1958. Sincere appreciation is extended to the three agencies cooperating in the field practice program. They are the Visiting Nurse Service of New York, the Visiting Nurse Association of Brooklyn and the Bureau of Public Health Nursing of the New York City Department of Health. Representatives have been most generous in finding time to attend meetings for discussion of our mutual problems. This year the field plan had two major additions over last year's plan — a pre-field seminar of two weeks prior to the four week placement and well qualified public health nurses as field instructors, one in the eight weeks official agency placement with the Bureau of Public Health Nursing of the New York City Department of Health and the other in the four week placement with the Visiting Nurse Association in Brooklyn. The development of the faculty field instructor has helped to relieve the burden on the agencies and, at the same time, maintain the educational focus of the students' experience. The more careful selection of experiences makes it possible for the same agency case load to provide practice in public health nursing to an increasing number of students. One other change from last year's pattern was introduced in the eight week placement. The students returned one day per week for all formal classes formerly given by the Visiting Nurse Service of New York. The public health faculty members of the department assumed the responsibility for this teaching concurrent with the field practice.

In public health research, the testing program followed approximately the same pattern as last year with the use of two tests: the American Public Health Association and the National League for Nursing. The work of the committee on competencies is being completed by Professor Dammann.

One hundred and one candidates of the Class of 1959 completed their examination for licensure in New York State in June, 1959. The results continue to be most favorable.

The department cooperated in the study of liberal education in the professions conducted by the Institute of Higher Education, Teachers College, under a grant from the Carnegie Corporation. Mr. Charles H. Russell spent several days in

scheduled interviews with faculty and nursing students. Liberal education for nursing is a topic of special interest to the faculty due to the need for more college graduates for leadership positions in nursing.

A consultation visit with Miss Margaret Shetland, Public Health Nursing Consultant, National League for Nursing, was held March thirtieth. Members of the faculty concerned with public health teaching and representatives of the three public health agencies were present; also Dr. Barnard and Dr. Dixon. Different patterns of field practice were discussed in an attempt to have theory and practice concurrent.

On October first, the Department of Nursing submitted a detailed report regarding public health and public health nursing in the curriculum to the Collegiate Board of Review of the National League for Nursing. The Department of Nursing of the Faculty of Medicine of Columbia University was granted approval for the public health nursing component of the National League for Nursing accredited baccalaureate program on December first by the National League for Nursing Collegiate Board of Review.

The tuition increase of two hundred dollars was effective at registration in September, 1958, bringing the total tuition and University fees, including application fee of \$10, to \$1,004. The tuition of \$850 is payable in three installments, \$350 at the beginning of the first and second year and \$150 at the beginning of the third year.

At the registration in September, 1958, ninety students, or twenty-four per cent of the student body, received tuition aid. In September, 1959, 100 students, or twenty-seven per cent of the total students, received scholarships. In September, 1958, the Louise and Gustavus Pfeiffer Foundation provided scholarships to twelve entering students, fourteen students in the Class of 1959 and ten students in the Class of 1960. In September, 1959, eleven students in the Class of 1961 and ten in the Class of 1960 received aid from the same source.

The Vivian B. Allen Scholarship was given to two students in September, 1958, and to five in September, 1959. The Jane McAllister Scholarship was given to one student in September, 1958. Contributions from the Classes of 1958, 1959 and 1960 were made to the McAllister Scholarship in

1959 and two members of the Class of 1960 received aid from this income. Two students in the Class of 1959 received assistance from the Margaret E. Conrad Scholarship in September, 1958. In February, 1959, funds were given by Mrs. G. E. Huggins to the Conrad Scholarship and the income from this Fund was awarded to three students. The Mary Sencindiver Specht Scholarship provided assistance to two students in September, 1958, and to one student in September, 1959.

The Columbia Bicentennial Fund of the Department of Nursing provided tuition aid for twenty-seven students in September, 1959. Eleven students received aid in September, 1958, from the Special Scholarship Fund. The proceeds of the Columbia Thrift Shop were received for credit to the fund and one student in September, 1959, received assistance from this source. The Women's Florist Association provided scholarship assistance for two students in September, 1958, and again in 1959. The Florist Telegraph Delivery Association gave aid in September, 1958 and 1959. The Greer Scholarship, through the courtesy of Mrs. S. Hazard Gillespie, was awarded in September, 1958 and 1959. The Dean Sage Scholarship was awarded in September, 1958, to a student in the Class of 1961 to cover tuition for the first and second years. It was awarded to two students in September, 1959. The Frederick Sturges, Jr. Scholarships were awarded to two entering students in September, 1958, and again in 1959.

The Alumnae Association in 1958 provided assistance for eight students. The William G. Holloway Scholarships were awarded for the first time in September, 1959, to eight members of the Class of 1960. The Robert Bacon Whitney Scholarships were awarded in 1959 to two members of the Class of 1961. The Wray Loan Fund was established in 1958 to be used as a revolving fund for our students who would pay back their loans without interest after graduation. The Special Scholarship Fund #2 was established with the proceeds from a card party in March, 1959, which was sponsored by the parents, faculty wives and friends of the department. Twenty students received tuition scholarships from this source.

The Nancy Whitman Wadsworth Scholarship Fund was established in memory of Mrs. Eliot

Wadsworth, a devoted alumna of the Class of 1913. A member of the Class of 1960 received the first award of this scholarship at the September, 1959, registration. Nine students received New York State Regents Scholarship in 1958 and eleven received them in 1959.

Graduate Program

The graduate program in maternity nursing in cooperation with the School of Public Health and Administrative Medicine, the Obstetrical and Gynecological Service of Presbyterian Hospital and the Maternity Center Association has completed a successful year. The third group of students completed the twelve-month program in September, 1958, and seven received the Master of Science degree in October, 1958.

In September, 1958, eight graduate nurses enrolled in the maternity nursing program. Three traineeships from the United States Public Health Service were assigned to the department by Dr. Trussell. In September, 1959, the fifth class to register for the eleven months program leading to the Master of Science degree had eight graduate nurses. Six traineeships from the United States Public Health Service were again made available.

In October, 1959, Master of Science degrees were awarded to four students. Two students completed the requirements in December, 1959, and will receive the degree in February, 1960.

The continued support and interest of the Maternity Center Association is very much appreciated. Miss Eunice K. MacDonald was appointed on June 1, 1959, to study the M.S. degree program and teach in the graduate program.

A total of fifty-three graduate nurses studying at Teachers College, Division of Nursing Education, have come to the Medical Center during 1958-59 for field work on a part-time basis in various areas. Mrs. Frances R. Kreuter, Associate Professor in the Division of Nursing Education at Teachers College, conducted practicum in the study of cardiac nursing during June, July and August, 1959. Fourteen graduate nurse educators participated in this program on medical, surgical and pediatric services of Presbyterian Hospital. A similar program in cardiac nursing was held September-December on the medical and surgical services for a group of twenty graduate nurses under Mrs. Kreuter's leadership.

During this year, twenty-six nurses made up a deficiency in obstetric nursing by completing the twelve-month course of instruction and practice in order to qualify for the license of registered nurse in New York State. Five graduates completed an eight-week course in neurologic nursing and nine graduate nurses an eight-week course in orthopedic nursing. These two courses were discontinued.

The inservice educational program has been expanded during this year. In order to fulfill the needs of the new staff nurse and to provide her with utmost satisfaction in her nursing, basic orientation has been concentrated into a two day program, including a tour, which is then continued for each nurse in the clinical area to which she is assigned.

A revision of the booklet "Information for the Graduate Staff Nurse" was published in May. Copies are given to each member of the nursing staff at orientation. Since September, each unit has assumed added responsibility for the inservice programs. The staff education committee, composed of the senior supervisor for nursing service from each clinical unit, has met with Miss Lillian A. Oring, Administrative Assistant for inservice education, and Mrs. Klauber to share ideas in developing the on-going staff education programs.

A new head nurse course in medical and surgical service started in the Fall and includes such topics as the development of effective communications, management of auxiliary nursing personnel, supervision of patient care and improvement of interdepartmental relationships. Meetings are held twice per month. Group participation and sharing of new ideas is proving worth-while.

Monthly meetings with a planned program for supervisors and head nurses from all units have been held on two consecutive days to facilitate full attendance. For the group of night supervisors and head nurses a monthly meeting is held in the morning at eight-thirty; a similar meeting is held in the afternoon at three-thirty for the evening supervisors and head nurses.

Graduate professional nurses, employed full-time on the hospital staff, are encouraged to continue their education through part-time study at one of the nearby universities in preparation for promotional opportunities. The tuition-aid plan, started in 1956, continues to attract nurses to the

staff, with a total of 217 nurses studying part-time this year, 125 in the Spring and ninety-two in the Autumn terms. They attended six universities, eighty-six per cent are studying toward a Bachelor of Science degree and fourteen per cent toward a Master of Arts degree.

Arthur Williams Scholarships were awarded to six graduate nurses who were granted leaves of absence for full-time study. A total of twenty nurses were on educational leaves during the Spring term and nineteen during the Autumn term.

Recruitment of Nurses

In October a summary of some 500 general duty nurses employed by the Presbyterian Hospital indicated that eighty per cent are graduates of 186 schools of nursing from thirty states; twenty per cent from foreign countries, including forty-nine nurses from Canada, fifty from England and seventeen from Ireland. Twelve per cent of the general duty nurses are graduates of the Department of Nursing and five per cent are graduates of schools of nursing whose students affiliate here for instruction and practice, mainly in pediatric nursing; twenty per cent are married; twenty-two per cent have Bachelor of Science degrees; six nurses are graduates of the two-year junior college program and hold Associate of Applied Science or Associate of Arts degrees.

Recruitment of graduate nurses during this year has been the most successful in recent years, all positions being filled, with the exception through June, July, August. During these months, general duty nurse vacancies averaged nineteen, or four per cent of the quota. For this period, nineteen college students and three others entering college in the Fall, were employed as paid nursing aides. They were given a special orientation program and assigned to the following areas: operating room, Harkness, medical-surgical, orthopedic and pediatric services. The majority of the group plan to enter medicine or nursing.

The full-page pictorial advertisements in the *American Journal of Nursing* have been continued monthly throughout the year. A total of 1,700 inquiries were received by mail or through interviews during the year.

Staff Appointments and Retirements

Miss Betty B. Jones was appointed Assistant

Professor of Nursing and Project Director of the Mental Health Training Grant, replacing Miss Anne McQuade and Mrs. Bertha Unger who resigned. Miss Gloria Dammann was appointed Assistant Professor of Public Health Nursing, a joint appointment with the School of Public Health and Administrative Medicine. The Public Health Nursing Research Project in the Department of Nursing is being studied and the recommendations evaluated by Miss Dammann. The Department of Nursing is indebted to Dr. Ray E. Trussell, DeLamar Professor of Administrative Medicine and Chairman of the School of Public Health and Administrative Medicine, for providing public health research funds for this appointment.

In Public Health, Miss Constance P. Cleary was promoted to Associate Professor of Nursing and Miss Eleanor E. Mills to Associate. Misses Phyllis Mollé and Mary Opalak were appointed Instructors. In Medical and Surgical, Miss Mary E. Windrow was made Assistant Professor of Nursing and Assistant Director of the Nursing Service, replacing Miss Ruth M. Guinter who resigned. Miss Elizabeth S. Gill was promoted to Assistant Professor. Also under Medical and Surgical, the following were appointed Instructors: Mrs. Althea M. Sigler, Misses Joyce E. Miller, Miss Frances F. Mulvey, Joan S. Roselle, Elizabeth A. Brown, Sherry A. Burns, Marion Fiske, Sheila L. Spector, Helen J. Morrison (Neurological), Teresita Maxwell, who was also made Supervisor of Women's Medical Service, and Patricia Westbrook, who was also made Supervisor of the Men's Surgical Service. Misses Mary A. Pieck, Eloise V. Cutler and Lorraine Jacobson were appointed as Associates.

In Pediatrics, the Misses Anne B. Freyfogle, Carolyn Dawson, Edith Luik and Mary Marcelon were appointed as Instructors; Miss Loretta Verdisco was appointed Instructor in Nursing (Orthopedics); Miss Mary Sullivan was appointed Instructor in Nursing (Psychiatry); Miss Joyce E. Bittner was appointed Director of Recreation.

During the year 1959, 420 new appointments on the Nursing Service were made to the professional nursing staff. Resignations totaled 368. The turnover rate for general duty nurses for the year 1959, was fifty-four per cent which is eight per cent less than the year 1958. The turnover

rate for the head nurse group was thirty-six per cent, a decrease of eight per cent from the prior year.

The decrease in turnover for the non-professional nursing personnel during this year is worthy of mention. The rate for the group of 237 nursing aides was twenty-nine per cent, as compared with thirty-four per cent for the year 1958. Increased wages and work satisfaction of the nursing aides are two main factors in this fine record. A regular schedule of inservice programs was held in addition to the orientation and teaching of new nursing aides.

Miss Cecile Covell, Assistant Director of Nursing Service for the Neurological Institute and Assistant Professor of Nursing, Department of Nursing, Faculty of Medicine, retired in September. As a member of the Nursing Staff for thirty-three years, Miss Covell was a leader in maintaining high standards of patient care; through her many talents she contributed to a wide variety of projects at the Medical Center.

Miss Mary E. Allanach retired in November, 1959, from her position as Assistant Professor of Nursing (Obstetrics) which she held since 1937. For twenty-seven years Miss Allanach taught nursing students, including the affiliating students at Sloane Hospital, and specialized in instruction for mothers in the care of the newborn.

Miss Martha E. Haber was appointed Assistant Director of Nursing Service and Assistant Professor of Nursing, Department of Nursing, Faculty of Medicine, in September, replacing Miss Covell. After nine years on the nursing staff as staff nurse, head nurse, and instructor at Neurological Institute, Miss Haber was granted a year's leave of absence for study and received her master's degree in nursing education at Teachers College, Columbia University in 1959.

Miss Catherine McDermot, Senior Supervisor of Nursing on the Pediatric Service, retired in October after thirty-one years of devoted service dating back to the old Babies Hospital where she held the position of Assistant Superintendent of Nurses.

In September, Miss Jane F. McConville was appointed Supervisor of Nursing in Babies Hospital upon her return from a year's leave of absence 1958-59, to complete her master's degree in nursing supervision at Teachers College, Columbia

University. Miss McConville was promoted from her former position as head nurse on the sixth floor of Babies Hospital.

Miss M. Cyrilla Page was appointed Administrative Assistant in charge of non-professional employees in nursing September first, replacing Mrs. Marilyn Hamel who resigned.

Mrs. Barbara Klauber was appointed assistant to Miss Lillian Oring in the inservice staff education program on September first, replacing Miss Page.

The 376 bed unit comprising the medical and surgical services was subdivided in September under a Medical Supervisor, Mrs. Margaret Tulevech, and a Surgical Supervisor, Miss Joyce E. Miller. This revised plan of organization should improve supervision of patient care in the various units including the recovery room and new special care unit on the eighteenth floor of Presbyterian Hospital. Miss Teresita Maxwell was appointed Supervisor of Women's Medical Service, replacing Mrs. Tulevech and Miss Patricia Westbrook, Supervisor of Men's Surgical Service, replacing Miss Miller.

Staff Activities

Exhibit of Nightingaliana was held in the University of Pennsylvania Museum during the National League for Nursing Convention in Philadelphia May 10-15, 1959. This exhibit was in honor of Miss Nightingale's birthday May 12 and the coming centennial of the nursing profession, the anniversary of the founding of the first Nightingale School of Nursing at St. Thomas' Hospital in 1860. Several items from the Florence Nightingale Collection in Maxwell Hall were loaned to this exhibit.

Members of our staff attended and took part in meetings and conferences throughout the country. Among them are the Institute on Maternity Care sponsored by the New York City Department of Health, the Dietetic Association Confer-

ence on Teaching in Schools of Nursing, the National League for Nursing Curriculum Conference in Albany, the New York State League for Nursing meeting, the Council of Member Agencies of Baccalaureate and Higher Degree Programs, the Eastern States Health Education Conference sponsored by the Academy of Medicine, the American Public Health Association Conference, the National League for Nursing Committee on Historical Source Materials in Nursing, the Health Professions Seminar in Columbia University, the Nursing Section of the American College of Surgeons, the National League for Nursing Institute for Head Nurses on Personnel Evaluation, the National League for Nursing Institute on Psychiatric Nursing, National Society for the Prevention of Blindness Conference, New York Heart Association Conference, New York State Nurses' Association Convention, the National Association for Practical Nurse Education and the Practical Nurses of New York Convention.

Professor Mary I. Crawford was elected President of the American College of Nurse-Midwifery at the annual meeting in Philadelphia. Professor Harriet M. Deleuran was granted a sabbatical leave for the Spring semester 1959. A trip through eight European countries was arranged with visits to the University of Edinburgh, University of Heidelberg, College of Nursing in Helsinki and a group of mental hospitals for the study of the nursing program.

International nurses have come to the Medical Center to learn about methods of patient care, inservice programs and the use of auxiliary personnel. Many have been guests in Maxwell Hall and have been included in selected department conferences which illustrate new ideas of interest to them. Also nurses have come from many parts of this country to see the recovery rooms, the special care unit for cardiac patients, the obstetric and pediatric services and the operating rooms.

Obstetrics and Gynecology

HOWARD C. TAYLOR, JR., *Professor and Chairman of the Department
Director of Service*

In the report of the Obstetrical and Gynecological Service to the Hospital for 1958, emphasis was given to problems arising from the increasing number of maternity cases which had strained the facilities of the labor and delivery rooms and the bed capacity of the wards. The amount of clinical work has diminished very slightly during the last year, but the clinical load seems to have provided fewer problems, perhaps because the staff is learning to adjust itself to a new tempo.

With respect to the number of patients treated by the Service, there are no major changes to be reported in comparison with the record of last year. Indeed, it appears that, within the framework of present standards of patient care and plans of organization, the limit of expansion in clinical work has been reached.

More detailed analysis of the work of the Obstetrical Service (Table 1) shows that in comparison with the year 1958, there has been a diminution of about a hundred in the total number of deliveries. There is to be noted, however, a modest increase in the private service, the slight change in distribution of case material being an advantageous one, in view of the relative availability of private beds. The number of clinic visits in obstetrics has remained virtually unchanged. (Table 2.)

The fetal mortality indicated a rate of loss of 30.5 per thousand on the ward service and 20.8 on the private. (Table 3.) These differences have been noted in most reported analyses and seem attributable to only partly understood socioeconomic causes. In the next table (Table 4), it is apparent that a large percentage of fetal losses occur in very small babies, those under 1500 grams in birth weight, which emphasizes again the enormous importance of premature labor among the unsolved obstetrical problems.

There were three maternal deaths during the year, an incidence of less than one in a thousand deliveries. Two of these were ascribable to obstetrical causes, namely, one death from eclamp-

sia and one from amniotic fluid embolus. The third was due to acute leukemia as a coincidental complication of pregnancy.

A table (Table 5) is included this year to show the number of technical procedures carried out in the delivery of 4,000 women who had their babies in Medical Center last year. Noteworthy, are 348 cesarean sections, carried out for many different indications. The majority, however, fell under the category of "repeat cesareans," evidence of the general view of the staff that after one section, future deliveries are most safely carried out in a similar way. The frequency of the mid-forceps operation is satisfactorily small.

The number of gynecological operations in all categories of service (Table 6) has remained about the same for a number of years, again reflecting the maximum use of facilities. The number of gynecologic outpatients is also rather constant. (Table 2.)

The extent of the work of the Department in gynecologic cancer is evident from statistics collected in the Follow-up Service conducted by Dr. David B. Moore. Last year, 1945 cases were being followed, of which 920 had been treated in the Sloane Hospital ward service, 407 in the Francis Delafield Hospital and 618 as private patients. With the aid of follow-up data, success in the treatment of cancer of the cervix, the corpus uteri and of the ovary is under constant analysis, to determine relative advantages of particular techniques of therapy.

Research Activities

In describing research work of the Department of Obstetrics and Gynecology during the last year, one must point out at once that this work has been carried on in wards and clinics of the Presbyterian Hospital, in laboratories of the College of Physicians and Surgeons, and in Francis Delafield Hospital. Recognition must be given also to the many cooperative projects in the field of human reproduction, made effective by an as-

sociation with members of many departments, but particularly perhaps those in Anesthesiology, Pediatrics and Medicine. Finally, acknowledgement must be made for the generous support of research received from the Isabel MacMillin Fund of the Presbyterian Hospital, the Josiah Macy, Jr., Foundation, the Population Council, the American Cancer Society, the Damon Runyan Memorial Fund, the United States Public Health Service and several anonymous donors.

REPRODUCTIVE PHYSIOLOGY

The biochemical laboratories of Dr. Seymour Lieberman, Associate Professor of Biochemistry in the Department of Obstetrics and Gynecology, devoted particularly to investigation of the biochemistry and metabolism of the steroid hormones afford a starting point for the fundamental approach to the physiology of the reproductive process. In this department, there are a number of skilled associates, working under Dr. Lieberman's direction on a number of essential problems.

The work of Dr. Shlomo Burstein has resulted in two publications, describing a superior method for hydrolysis of steroid hydrogen sulfates, an important advance in steroid technology. This technique has led to development of a procedure for clinical estimation of sulfates of dehydroisoandrosterone and androsterone in blood plasma which, in turn, has led to the discovery that dehydroisoandrosterone is usually the most abundant steroid in human peripheral plasma.

The biosynthetic pathways by which steroid hormones are made in the body has continued to be the field of work of Professor Samuel Solomon. He has been particularly concerned with intermediates that exist between cholesterol and pregnenolone and in determining the precursor of dehydroisoandrosterone. Studying a patient with extensive metastases from an adrenal carcinoma as well as normal individuals, he established for the first time a steroidal precursor of dehydroisoandrosterone in the form of 17α -hydroxy- Δ^5 -pregnenolone.

The origin and metabolism of dehydroisoandrosterone has been studied by Dr. Raymond Vande Wiele, who, by measuring the secretory rate of this 17-ketosteroid, discovered that it is one of the most abundantly produced steroids, the amount synthesized per day varying between

15 and 50 mg. He has shown furthermore that dehydroisoandrosterone is a principal precursor of urinary androsterone and etiocholanolone, so that it now appears that the three most abundant ketosteroids (dehydroisoandrosterone, androsterone, and etiocholanolone) are, either dehydroisoandrosterone itself, or derived from it.

Methods suitable for estimation of the secretory rates of estrogen and estradiol are now being developed by Dr. Erlio Gorpide. The eventual objective is to estimate production of these female sex hormones in normal and abnormal pregnancy, in patients with endometrial hyperplasia and in others with various forms of amenorrhoea.

Reports have been made in two publications on urinary 17-ketosteroids secreted by patients with Cushing's Disease due to adreno-cortical hyperplasia and by patients with adrenal cortical tumors. The investigation is being extended to the study of patients with virilism due to ovarian pathology.

A technique for determination of the secretory rate of aldosterone, having been developed by Dr. Stanley Ulick and Dr. John H. Laragh, Assistant Professor of Medicine and Assistant Attending Physician, is being applied to the study of a variety of sodium-retaining and sodium-losing states, including toxemia of pregnancy.

Work is continuing on preparation and investigation of the properties of conjugates made by coupling steroid hormones to proteins. About twenty such conjugates have been made and most of these have been shown to be antigenic. The antihormonal properties of some of these conjugates are now being studied and attempts to immunize human subjects are being made.

Professor Joseph W. Jailer's investigations have continued on the human adrenal gland and on certain of the functions of the anterior pituitary. The use of an amphenone derivative, which selectively inhibits 11 β -hydroxylation in the human adrenal gland has been used to confirm a previously advanced hypothesis that there is a relative lack of C-21 hydroxylation in the synthesis of hydrocortisone in this condition. It has also been shown that this compound interferes with the synthesis of the sodium-retaining steroid, aldosterone and, under proper conditions, may cause sodium diuresis. The role of the central nervous system in the control of certain anterior pituitary

functions has been shown in certain patients with hypothalamic lesions who cannot respond to stress by the secretion of ACTH.

The problem of the polycystic ovary, a condition associated with many cases of menstrual disorder and infertility, has been the object of continued study by Professor Anna Southam, Dr. Raymond Vande Wiele and Dr. Ilse Schindl, Barnes-Foster Fellow. The histologic study of these ovaries is being continued in collaboration with Dr. William Ober. Results of the treatment of over a hundred patients have been evaluated in an attempt to define indications for surgical treatment of the condition.

Professor Landrum Shettles is continuing his work on fertilization and early developmental stages of the human ovum. Dr. Shettles has also been working with Dr. Frederic Agate, Associate Professor of Anatomy, toward the development of an accurate method for determination of the rate and variations of rate in blood flow in the pelvis.

As a contribution to the problem of fertility, Dr. Vincent Freda, Senior Resident, has reported the finding of blood group substances A, B, and O (H) corresponding to the blood group of the individual. These are found in high titer if the person is a secretor, the amount detectable in the cervical mucus being equivalent to that present in the saliva of the same individual. Since small amounts of serum isoantibodies may seep into the cervical mucus, when cervical erosions are present, the possibility exists of a relationship of this phenomenon to problems of infertility.

Professor Henry Clay Frick working with Dr. Hans H. Neumann, Research Assistant in Dentistry, is developing a technique for occlusion of the Fallopian tubes, by means of metal clips applied by a special instrument using the technique of culdoscopy.

The possibility that serotonin might be the cause of menopausal flush has been largely excluded by Dr. Robert A. Munsick. His studies showed that the principal metabolite of serotonin, 5-hydroxyindoleacetic acid, is not excreted in increased amounts in women with menopausal flush.

PHYSIOLOGY OF PREGNANCY

The evident importance of the placenta as the essential organ for supplying the fetus with es-

sentials of growth and survival has led to increasing concentrations of interest on its investigation.

Professor Albert Plentl, working in association with Dr. Mary Jane Gray, Dr. Maurice Grynfogel and Dr. William T. Kelly, has been particularly concerned with application of tracer techniques to the study of fetal nutrition in utero and the mechanisms of placental transmission. Studies on the transfer of respiratory gases across the placenta and parallel investigations on metabolism of lactic acid have been completed. The findings from this work point to a previously unsuspected exchange of these substances between the maternal and fetal organisms and constitute evidence that the fetus oxidizes carbohydrates in a manner quite similar to that of its mother.

Investigations of this group are now turning to the mechanism of transmission of nitrogenous substances. Of these, some of the amino acids have been studied by similar but more complex methods. Doctors Kelly and Plentl devoted most of last year to the synthesis of specifically labelled radioactive amino acids, their identification and isolation from minute amounts of blood from pregnant primates. The data are compatible with the existence of a rapid and continuous exchange of these nutrients.

Dr. Emanuel Friedman has been studying oxygen utilization of fresh tissue by Warburg respirometric determinations. The work is now being extended to effects of various substrates, in an attempt to uncover conditions of importance in actual physiologic processes and to correlate alterations in the aerobic metabolism of the placenta with histopathologic findings.

Of importance, second only to that of the placenta for development of the fetus, is the extraordinary transformation occurring in the lining of the uterus known as the "decidual reaction," which occurs during pregnancy. The formation of the early decidua is due to stimulation by progesterone, but in advancing pregnancy factors of the placenta, the fetus and uterine distention complicate the study of the placenta. Professor Harold Speert became impressed with the opportunities afforded by the study of the decidua in the uteri of patients in whom pregnancy was developing outside of the uterus, as an "ectopic," and accordingly collected a series of uteri removed for this condition at various stages from

4½ weeks gestation to full term. These observations have shed a new light on the significance of vaginal bleeding in ectopic pregnancy and have disproved the commonly held belief that vaginal bleeding in this condition signified fetal death.

During pregnancy, many notable changes occur also in maternal physiologic functions. Dr. William Little has been determining the presence of various enzymes and other protein fractions in the sera, tissues and amniotic fluids obtained from normal and pathologic gestations. Dr. Louise Phillips, with Dr. James Weir, has been examining electrophoresis patterns of serum proteins of women at various stages of pregnancy and will extend this work to similar observations in patients with toxemia of pregnancy and those producing fetal abnormalities. Professor Gilbert J. Vosburgh, with Dr. John Sciarra is continuing a study of serum levels of an enzyme, leucyl-amino-peptidase during pregnancy and, with Dr. Morton Stenchever, is examining the behavior of the magnesium ion in various obstetrical conditions, including toxemia of pregnancy.

The function of the adrenal gland during pregnancy has been studied by Dr. Joseph W. Jailer, in collaboration with Dr. Nicholas P. Christy, Associate in Medicine and Assistant Physician, and Dr. Wilfred W. E. L. Gordon. It has been found that although plasma levels of circulating hydrocortisone are elevated during the third trimester, this may not necessarily reflect increased adrenal function since the half-life of administered hydrocortisone seems to be elevated. Other experiments indicate that at least a fraction of the circulating hydrocortisone is biologically inert. The half-life of administered tetrahydro-hydrocortisone is normal, indicating that one of the difficulties is a decrease in the rate of reduction of the A ring of hydrocortisone in the pregnant state.

PROBLEMS OF LABOR

To the obstetrician, the successful termination of labor has been traditionally thought of as depending upon two major factors, the effectiveness of the uterine contractions and the relative resistance offered by the bones of the pelvis and other maternal tissues to the passage of the fetus. Last year, work in this department has been particularly concerned with the pharmacological factors increasing the efficiency of uterine action in labor.

Working in the Department of Pharmacology as a Josiah Macy, Jr., Foundation Fellow, under Professor Harry van Dyke, Dr. Robert A. Munsick has studied pharmacological properties of various highly purified neurohypophyseal hormones and their analogues. The work has led to the discovery of a previously unknown naturally occurring hormone, arginine vasotocin. This substance has been synthesized by Katsoyannis and duVigneaud as an interesting analogue of oxytocin and arginine vasopressin.

Working with Dr. Mary Jane Gray and others, Dr. Albert Plentl has completed an extensive clinical evaluation on the previously mentioned oxytocic agent, sparteine sulfate, in over 1,500 unselected ward patients.

Professor Landrum Shettles has completed a study on hourly variation in the onset of labor and on the rupture of membranes.

A newly developed technique of measuring milk-ejection in lactating women has been developed by Dr. Emanuel Friedman for the study of effects of various pharmacological substances on lactation and milk-ejection. A clinical study of the effectiveness of some pharmacological preparations for this purpose is in progress.

The work of Dr. Louise Phillips on the study of clotting mechanisms in hemorrhage, with special reference to the role of fibrinolysin, is proceeding. It has been shown whenever low fibrinogen levels result in severe hemorrhage in obstetrics, but also in extensive surgical operations and in patients with prostatic carcinoma, that profibrinolysin and antifibrinolysin levels are depressed. This suggests that activation of the enzyme is a common cause of the hypofibrinogenemia in all of these cases.

THE FETUS AND THE NEWBORN

The important subject of the most favorable temperature at which the newborn should be maintained was investigated by Dr. Karlis Adamsons, while serving as a Josiah Macy, Jr. Foundation Fellow with Professor G. S. Dawes at the Nuffield Institute for Medical Research at the University of Oxford. The main objective was to establish optimal thermal conditions during air breathing and hypoxia brought about by administration of ten per cent oxygen in newborn and young rabbits. Lowering of the environ-

mental temperature elicited a prompt and considerable increase in oxygen consumption which was proportionally greater in the newborn group than in older animals. In the neutral environment, in which metabolism is minimal, hypoxic stimulation resulted in a sustained hyperpnea, but this response was significantly impaired in lower environmental temperatures. In contrast to previously held views, it was demonstrated that ten per cent oxygen breathing did not reduce oxygen consumption of the newborn animal in neutral environment, but merely eliminated additional metabolism seen in sub-optimal conditions.

Work carried on in the Sloane Hospital delivery room and associated laboratories, by Dr. Stanley James, Assistant Professor of Pediatrics assigned to Anesthesiology, has resulted in important observations on the physiology of the newborn infant, which may lead to significant progress in the care of the newborn during the crucial first hours of life. These studies have concerned particularly the acid-base balance of the newborn infant and certain aspects of cardiovascular adjustment after birth.

Acid-base balance studies of the newborn infant have revealed that a mild to severe acidosis is present at birth. The relationship of this to oxygen levels and the pattern of recovery in the hours following delivery suggest that acidosis reflects a limited period of asphyxia and not normal intrauterine environment. Since oxygen levels are extremely labile it is felt that the degree of acidosis is a truer indication of the period of oxygen deprivation.

Rising maternal lactic acid levels have previously been taken to indicate a greater degree of anaerobic metabolism as pregnancy advances. Serial determinations done after twenty-four hours bed rest have failed to support this view in normal mothers, lactic acids remaining between .8 and 1.4 mEq/liter. During labor, levels are extremely variable. It has been concluded that maternal lactic acid levels cannot be used as a measurement of anaerobic metabolism of the newborn baby.

Cardiovascular adjustment in the newborn has been a second main object of study by Dr. James and his group. Using catheterization and the recording of vascular pressures, chemical analysis of cord blood and of arterial and venous

samples from the baby, radiography, and phonocardiography, relationships between the occurrence of asphyxia and signs of maladjustment in the cardiovascular system have been examined. Some evidence has been obtained for cardiac enlargement occurring with clinical signs of difficult breathing and cardiac murmur in the baby.

Study of the fetal heart rate by use of the electrocardiogram has been made on 130 infants and detailed analysis of seventy-nine infants have been studied. The heart rate has been recorded during normal and abnormal labor and during the process of delivery and the onset of respiration. In the vigorous infant the heart rate at birth tends to fluctuate markedly during the onset of respiration, but within seconds reaches a stable rate varying between 135-155 beats per minute. This rate has been noted even though oxygen saturation of the arterial blood has been less than fifteen per cent. In infants who do not cry vigorously before the cord is clamped, a marked fall in heart rate has been noted when the cord is clamped. In this more depressed group, the heart rate continues at between 155-185 once respiration is established, falling gradually over the next few hours to the same rate as in the vigorous group.

The pathogenesis of hemolytic disease of the newborn, due to the ABO factors rather than to the Rh factor, has been further studied by Dr. Vincent J. Freda. In association with workers from other hospitals, a detailed analysis has been made of fifty-one families in which ABO hemolytic disease occurred. The complete serological make-up and secretor status was determined for every member of each family, the significant finding being that once severe ABO hemolytic disease occurred in a given family, then with rare exception all future babies will be affected unless they belong to group O. Studies on the secretor status lend clinical proof to theories first proposed by Dr. Freda and referred to in the Annual Report of this department a year ago.

Anatomical and pathologic studies of various placental and umbilical cord lesions have been related to fetal results in extensive studies carried on by Dr. William Little. An analysis of placental infarction has demonstrated this lesion to be associated with perinatal mortality and morbidity. Umbilical artery aplasia has been found to occur

relatively frequently (0.75%) and its detection may, it is believed, aid in estimating the prognosis of a newborn.

A retrospective study of the course of pregnancy and type of delivery in children subsequently developing cerebral palsy has been completed by Dr. Charles M. Steer and Dr. Walter Bonney. This study indicates that mechanical difficulties in delivery are of no significance in causing this disorder, the important factor being the decrease in the amount of oxygen available to the child.

GYNECOLOGIC NEOPLASMS

The important program in radiosensitivity testing of cervical carcinoma by serial biopsy has been continued by Professor Saul B. Gusberg and Dr. Grace Herman. This testing method has been in practical clinical use on the gynecologic wards of both Sloane Hospital and Francis Delafield Hospital since January 1, 1959, and thirty cases have been so studied. The prognostic accuracy, as determined on previously observed cases after a two to five year follow-up period, has been of the order of seventy-five per cent. In parallel with radiosensitivity testing by biopsy, evaluation of cytological techniques of the Grahams has been carried on. It has been found that SR (sensitivity response) is unsatisfactory as a prognostic guide therapy in cervical cancer, while the evaluation of RR (radiation response) is not yet completed.

Observations of serum enzyme levels in patients with cervical cancer undergoing radiation therapy is being carried on in collaboration with Dr. William Little. To date, some forty patients have been studied and preliminary results suggest that there is a significant rise in serum transaminase levels in patients showing a marked radiation reaction.

The general program, designed to detect and correlate determinable biological and biochemical factors underlying different grades of malignancy or differentiation in carcinoma of the ovary, is proceeding under the general supervision of Professors Seymour Lieberman and Howard C. Taylor, Jr. Dr. Helena deRoeth has completed a study of survival rates of tumors of different grades by following glycolysis and oxygen consumption throughout a period of storage at room

temperature. Dr. Saul Bader has reported variations in amounts of desoxyribose-nucleic acid indicating some differences in rate of cell division or in percentage of cells with abnormal chromosome numbers (polyploidy) in relation also to different grades of malignancy.

Dr. Hyman Guthwin is working to develop methods of fractioning cells of gynecological tumors in such a way that neither morphologic integrity nor biochemical function of the particulates will be destroyed. With this aim, he has been employing centrifugal homogenization, ultrasonic and enzymatic techniques. Dr. Inez Mandl, who has recently joined this group, proposes to investigate the effect of various proteolytic enzymes upon tumors of human origin and will attempt to relate proteolytic enzymes present in such tumors to their invasive capacity. Dr. Margaret Long has been comparing nucleolar status of cells of ovarian tumors, as they appear in solid portions of primary and metastatic tumors, with those in the ascitic fluid phase.

Dr. Long, with Dr. Fumio Doko, has completed an evaluation of nucleolar ribonucleic acid in cervical tissues and has shown that nucleolar differences exist between nonmalignant cervical tissues and cervical epidermoid carcinoma, but that none exists between different grades of malignant tumor as established by traditional criteria.

Dr. Henry Clay Frick, in collaboration with members of the Department of Surgery, Dr. Frederic P. Herter and Dr. James R. Malm, has been studying the effects of the administration of high concentration cancerocidal drugs administered by means of perfusion techniques. Histological control of the effect of these treatments on the malignant tissues being carried on by Dr. Long who has observed from a study of serial biopsies taken before and at intervals after perfusion that in some patients the effect of an alkylating agent may be observed within four hours of a single massive treatment.

Continuing his work on the relationship between radiation and transplantability of human tumor tissue into the cheek pouch of the hamster, Dr. Harold M. M. Tovell reports a correlation between microscopically observable cellular changes following radiation and transplantability in about seventy-five per cent. However, in the remainder, there appeared to be no relationship between the

degree of histological change and capacity to grow after transplantation.

CLINICAL AND MISCELLANEOUS STUDIES

Beside laboratory research reported in the previous section, essential and important analysis of the clinical work of the Department has continued. It has been participated in by many members of the clinical staff.

The ward service in Obstetrics continues to be the recipient of many cases coming to the Medical Center because of serious constitutional disease complicating their pregnancies, and these offer many opportunities for study of the interrelationship of severe illness and pregnancy. Results of the Asian influenza epidemic of 1957 at the Sloane Hospital, during which there occurred two maternal deaths, have been reviewed by Dr. J. Courtland Robinson and Dr. Jaroslav F. Hulka, members of the House Staff and published in a paper entitled "Influenza in Pregnancy." Professor Alvin J. B. Tillman, Dr. Alan Kaplan and Dr. Julian Smith have been working on the cases of pregnancy complicated by chronic glomerulo-nephritis; Dr. Arnold Fenton has completed the study of Gaucher's Disease in Pregnancy and Drs. Friedman and Little are working on the cases of gout complicating pregnancy.

The increased interest in the fetus and newborn is attested by the number of analyses being made on various aspects of perinatal mortality. Various factors contributing to mortality among twins have been studied by Dr. Friedman and Dr. Little and the best plan of management for delivery of twins formulated. The management of cases in which intra-uterine fetal death occurs before the onset of labor has likewise been studied by Dr. Dean J. Grandin and Professor V. William Cavanagh has completed an analysis of the fetal results in cases in which pregnancy goes beyond term at forty weeks and produces a condition described as "post-maturity." Dr. Charles M. Stcer and Dr. Fenton have reported the results of cases in which observed alterations in the fetal heart indicate fetal distress before delivery.

Much of the clinical work in gynecology has concerned the ever increasing problem of malignant tumors. Professor Henry Clay Frick has made a thorough investigation of the compara-

tive incidence of complications in radiation and surgically treated cases of cancer of the cervix and Professor Equinn W. Munnell is working with Dr. William Bonney on the study of distribution of recurrences, as indicative of special types of failure in the therapy of cancer of the cervix. With Dr. William Ober, Instructor in Surgery, Dr. Harold M. Tovell is studying mesenchymal sarcomas and malignant lymphomas of the uterus. Dr. Saul B. Gusberg is completing work involving clinical and pathological studies of cancer of the endometrium. Dr. Duane W. Todd has been studying the problem of the Papanicolaou vaginal smear Class III, the so-called "suspicious" type, with respect to the actual findings in such doubtful cases and the results of treatment.

With respect to the more general problems of gynecology, Dr. William A. Little and Dr. Emanuel Friedman have been experimenting with combinations of fibrinolysin and desoxyribonuclease preparations as debridement agents in the treatment of cervical erosions and Dr. Jaroslav F. Hulka and Dr. George Higgins have become interested in injuries of the cervix, in the form of small lacerations, sustained during the process of dilation prior to curettage. This work is being carried out on surgically removed uteri, and it is believed that results of the study may have some significance in explaining damage resulting in the incompetent cervical or syndrome.

Historical researches of Professor Harold Speert on eponyms of obstetrics and gynecology were published by the Macmillan Company in a 700 page book entitled "Obstetric and Gynecologic Milestones."

TEACHING ORGANIZATION

The curriculum in obstetrics and gynecology continues without essential change. Efforts have been made to provide some clinical contact for the third year student.

THE JOSIAH MACY JR. FELLOWSHIP PROGRAM

Since 1955, funds have been available, through a generous grant of the Josiah Macy Jr. Foundation, for research and teaching in obstetrics and gynecology with the special objective of developing academic personnel for the field. The grant has been devoted to work at two levels of the edu-

cational ladder. Scholarships have been awarded for medical student research, especially to students working in the summer months between their first and second years. Fellowships have been given to men, before, during, or after their clinical residency in obstetrics and gynecology, to enable them to spend one or more years in research training.

During the last year, scholarships for summer or part time research have been given to twelve medical students, who have worked in one of the basic science departments or in one of the laboratories of the Department of Obstetrics and Gynecology. In each case, the subject of their work has been related to techniques of value in investigation of problems of the reproductive process.

Fellowships, under the Josiah Macy, Jr. grant in the academic year 1959-1960, are being held by six men at the Medical Center; Dr. Charles Christian, Dr. William T. Kelly, Dr. William A. Little, Dr. Orlando J. Miller, Dr. Robert A. Munsick and Dr. C. Edward Prince. Dr. Jack N. Blechner is working under a Macy Fellowship in the Department of Physiology at the Yale Medical School, preparatory to coming here as an Assistant Resident in July, 1960, and Dr. Karlis Adamsons, now a Resident in this department, spent the academic year 1958-1959 at the Nuffield Institute in Oxford.

This program, now in its fourth year, is gaining momentum. If its present promise is fulfilled, this program, with its counterparts in three other medical schools, should make a considerable contribution to academic obstetrics and gynecology in the United States.

GRADUATE PROGRAM IN MATERNITY NURSING

Miss Eunice K. MacDonald, a graduate of Waltham Hospital School of Nursing and a holder of the degree of Master of Public Health from Columbia, joined the faculty in June, 1959, and is now in charge of the Graduate Program in Maternity Nursing. Seven students completed this program in September, 1959, and eight new ones enrolled in the same month.

Returns from a questionnaire to all graduates of the program have given us some indication of what these graduates are doing, and of what value the program has been to them. Four have returned to assume responsible positions in nursing

education and nursing service in this department. Two are teaching in nurse-midwifery, two in parent education and four in maternity nursing elsewhere in the United States. Twelve have left the country to participate in World Health or Missionary work. Four are participating in maternal and child health work in state or provincial health departments, and one has elected to return to school and is currently working for her M.P.H. degree. Thus far the returns on this questionnaire indicate general satisfaction with the program with the possible need for improving the clinical experience in the area of intrapartum care.

OBSTETRICAL ANESTHESIA

The skillful use of analgesic and anesthetic agents for the alleviation of pain in childbirth has been one of the most characteristic accomplishments of modern American obstetrics. That this poses a special problem is at once apparent when it is remembered that most anesthetics affect not only the maternal consciousness, but the efficiency of uterine contractions and, more particularly, the newborn's ability rapidly to adjust its respiratory and circulatory functions to its new environment. The importance and uniqueness of this problem has been recognized by the specific assignment of an anesthesiologist to the Sloane Hospital Division of Anesthesia.

The position of Director of the Sloane Hospital Anesthesiology Service was created about ten years ago and immediately filled by Dr. Virginia Apgar, whose energy and enthusiasm were an inspiration to the Obstetrical Division. On July 1, 1959, Dr. Apgar resigned to assume Directorship of the Congenital Defects Department of the National Foundation. Her place was taken by Dr. Frank Moya, who has ably filled the position since July 1, 1959. Beside the supervision of clinical anesthesiology in the daily work of the Obstetrical Service, Dr. Moya has been working on the crucial problem of placental transmission of the muscle relaxant, succinyl choline.

BULLETIN OF THE SLOANE HOSPITAL

The Sloane Hospital Bulletin has completed five years of publication and now has a circulation of over 1,000. This year, following an intensive effort to obtain financial support through

advertising and donations from ethical drug houses, the cost of publication has almost been met. There is no doubt of the recognition this little journal has received, a point evident to anyone traveling abroad and receiving the many favorable comments.

The material which has been published to date is quite interesting to review. Seventy-five original articles have appeared; "Standard Practices of The Sloane Hospital" have been described for nineteen separate procedures. Twenty-two extra-departmental authors have contributed articles. Fifteen books have been reviewed by Dr. Speert. Sixteen case histories with full discussions from the weekly staff conferences of the department have been published under the editorship of Dr. Friedman.

THE COLLABORATIVE STUDY OF CEREBRAL PALSY

The collaborative study, attempting to determine prospectively, factors contributing to development of cerebral palsy and associated neurological diseases is now in its second year. The mechanisms of case selection, interviewing techniques and data collection with reference to genetic, socio-economic and maternal antepartum and intrapartum factors have been worked out in detail so that the obstetrical unit, under Dr. Emanuel A. Friedman, is a smoothly functioning, efficient organization. Randomly chosen mothers, numbering about 600 yearly, are being studied in many parameters; their offspring are being carefully observed during the newborn period and the subsequent six years by the pediatric unit with emphasis on growth and development, and neurological and psychological progress. Data thus collected are being processed, with similar data from the fifteen other collaborating universities, by the National Institute of Neurological Diseases and Blindness of the United States Public Health Service.

Fellows and Visitors

In addition to the fellows under the Josiah Macy, Jr., Foundation grant, which have been discussed in a special heading, note should be made of several others. Dr. Nuran Turksoy, Barnes Foster Fellow, coming from Izmir in Turkey is working in the laboratory of Dr. Louise Phillips investigating changes of the fibrinolytic

enzyme system in the normal menstrual cycle and women with dysfunctional bleeding and other menstrual abnormalities observed in the sterility clinic under the direction of Dr. Anna Southam. Dr. Maurice Grynfogel, a Fulbright Fellow, from the University of Toulouse, has spent fifteen months in this department in the laboratory of Dr. Albert Plentl, contributing substantially to the studies of Dr. Plentl's group on placental transmission.

Five fellows have been working in Dr. Jailer's Endocrine Laboratory, namely, Dr. Jack H. Openheimer, Dr. Andrew G. Frantz, Dr. Leonard V. Fisher, under a Fellowship in the United States Public Health Service; Dr. Fred H. Katz, under a Fellowship from The National Foundation and Dr. Christopher Longcope, under the Dazian Foundation.

Visitors to the department came from various foreign countries, including Argentina, England, Vietnam, Japan, Brazil, India, France, Mexico, Switzerland, Australia, Chili, Canada, Germany, Egypt, Central America, Sweden, Finland, Peru, El Salvador, South Africa, Portugal, Uruguay, New Zealand, Indonesia, Lebanon, Scotland, Ecuador, Philippines, Luxembourg, Italy, Czechoslovakia, Turkey, Pakistan, Formosa, Hong Kong, Ghana, Russia, Yugoslavia and Greece. These visitors totaled ninety-four. There were also numerous visitors from the United States. Among the particularly distinguished visitors were Dr. Hans Kottmeier, Director of the Radiumhemmet in Stockholm, Sweden who was with us for a month; Professor Yoshio Ashitaka, Osaka University in Japan; Professor Abdus Choudhuri from Pakistan and Professor Reddy from India.

Promotions and Resignations

Dr. Mary Jane Gray, who first came to Sloane Hospital as Assistant Resident in 1950 and became a member of the Attending Staff in 1956, resigned as a member of the Department on December 31, 1959, in order to become Assistant Professor of Obstetrics and Gynecology at the University of Vermont in Burlington. Dr. Gray's work, which has been devoted to various aspects of the physiology of the pregnant woman and to the use of radiation in treatment of gynecologic neoplasms, has left a place difficult to fill in the Department.

On July 1, 1959, Dr. Equinn W. Munnell was promoted to the rank of Associate Clinical Professor of Obstetrics and Gynecology and to that of Associate Attending in the Hospital. At the same time, Dr. Anna Southam was promoted to the rank of Associate Professor of Obstetrics and Gynecology and Associate Attending Obstetrician and Gynecologist. Dr. John B. Rearden was promoted to Assistant Clinical Professor and Assistant Attending Obstetrician and Gynecologist. Drs. Friedman and Vande Wiele were promoted to the rank of Associate.

Travels, Honors, Special Lectures

Participation in meetings of the American College of Surgeons Clinical Congress was an outstanding feature of the extramural activities of the staff last year. At the annual Clinical Congress held in Atlantic City in October, 1959, four members of the department were on the program, Dr. Stanley M. Bysshe, Dr. Henry Clay Frick, Dr. William Little and Dr. Equinn W. Munnell. Earlier in the year at the Sectional Meeting of the American College of Surgeons held in Montreal, Quebec in April, 1959, participants from the department included Dr. Charles M. Steer, Dr. Henry Clay Frick, Dr. William Cavanagh, Dr. Equinn Munnell, and Dr. Landrum Shettles. Drs. Gusberg, Munnell and Taylor participated also on programs of the American College of Obstetricians and Gynecologists. Lectures have been given and papers presented in this country, by a number of other members of the department, notably Dr. Joseph Jailer, Dr. Saul Gusberg, Dr. Emanuel Friedman, Dr. Grace Herman, Dr. Dean Gran-

din, Dr. Seymour Lieberman, Dr. Samuel Solomon, Dr. Anna Southam, Dr. Arnold Fenton, Dr. Charles Steer, Dr. Alvin J. B. Tillman and others.

A number of members of the department have made trips abroad where they participated in major conferences. Dr. Seymour Lieberman and Dr. Raymond Vande Wiele both attended the Fourth International Congress of Biochemistry held in Vienna in the summer of 1958, and made presentations. Dr. Landrum Shettles and Dr. Oscar K. Adamsons, Jr., attended the 32nd Congress of the German Gynecological Society held in Frankfurt in September, 1959, and at this Congress, Dr. Shettles presented a paper entitled "Die Lebende Menschliche Eizelle." In September, 1959, Dr. Mary Jane Gray returned to the Radiumhemmet in Stockholm in order to complete a study on radiation injuries following the radiumtherapy of carcinoma of the cervix. Dr. Adamsons, while spending his year as Macy Fellow at the Nuffield Institute in Oxford, delivered a paper before the British Physiological Society in Cambridge in May, 1959. Dr. David Moore addressed the Middle East Medical Assembly at the American University in Beirut, Lebanon in May, 1959, and proceeded then to Amsterdam where he attended the International Congress on Fertility and Sterility. In July of 1958, Dr. Saul Gusberg delivered lectures at the International Cancer Conference in London, the International Gynecologic Conference at Brussels and at the Radiumhemmet in Stockholm. In July of 1959, Dr. Taylor delivered the Guest Address for the British Congress of Obstetrics and Gynecology held in Cardiff, Wales.

TABLE 1
VIABLE DELIVERIES

	1946-1955 (average)	1956	1957	1958	1959
Ward	2,183	2,815	2,779	3,105	2,936
Semi-Private	763	806	829	763	796
Private	636	499	582	598	650
Total	3,582	4,120	4,190	4,466	4,382

TABLE 2
CLINIC VISITS

	1955	1956	1957	1958	1959
Obstetrical	24,404	25,502	24,781	27,639	25,071
Gynecological	17,086	16,499	16,793	16,888	17,459
Total	41,490	41,001	41,574	44,257	42,530

TABLE 3
FETAL MORTALITY

	1946-1955 (average)	1956	1957	1958	1959
Ward	30.2/M	25.6/M	27.2/M	25.4/M	30.5/M
Private and Semi-Private	22.9/M	15.3/M	21.2/M	24.9/M	20.8/M

TABLE 4
RELATION OF BIRTHWEIGHT TO PERINATAL MORTALITY

Weights	Total Births	Total Stillbirths & Neonatal Deaths	Per Cent Perinatal Mortality
500 to 1,000 grams	34	33	97
1,000 to 1,500 grams	55	35	64
1,500 to 2,500 grams	380	49	12.8
Over 2,500 grams	3,974	36	0.91

TABLE 5
OPERATIVE DELIVERIES 1959

	Ward	Private	Total
Cesarean Sections	206	142	348
Primary Sections	96	77	173
Repeat Sections	110	65	175
Mid Forceps	52	52	104
Low Forceps	922	530	1,452
Breech Deliveries	96	41	137

TABLE 6
GYNECOLOGIC OPERATIONS

	1946-1955 (average)	1956	1957	1958	1959
Gynecologic Operations					
Ward	803	845	919	900	878
Semi-Private	299	527	564	632	606
Private	521	386	419	406	463
	1,623	1,758	1,902	1,938	1,947

Ophthalmology

A. GERARD DEVOE, *Harkness Professor and Chairman of the Department
Director of Service*

With the retirement on June 30, 1959, of Professor John H. Dunnington, Chairman of the Department and Director of the Service of Ophthalmology since 1939, the department has suffered a serious loss, only partially mitigated by the fact that, as Professor Emeritus, Dr. Dunnington's vast clinical wisdom, skill and competence will still remain at our disposal. In general, the routine activities of the Eye Institute have progressed in a manner not unlike those of previous years. 3,212 patients were admitted to the hospital for a total of 27,325 patient days, a figure somewhat higher than last year. 3,081 operative procedures were carried out. It is well to point out that the recovery room which was installed October 13, 1958, has thoroughly demonstrated its value.

In many institutions, decline in outpatient population has posed serious problems to resident training. In the Vanderbilt Clinic, 29,008 visits were made by 8,520 outpatients in the Eye Department, an increase over last year and more than enough to permit us adequately to carry out our teaching and training obligations.

Intradepartmental Activities

Within the Institute, numerous ancillary units contribute greatly to the overall effectiveness of the department. These include the John M. Wheeler Library, now one of the most complete eye libraries in the world, containing at the present time 7,336 bound volumes and 159 current journals.

In the Photographic Department, some 1,500 clinical photographs were taken in addition to several thousand lantern slides, photomicrographs and prints for use in demonstrations, articles and the like.

Mr. Emil G. Bethke, staff artist, has produced numerous charts, posters, graphs and clinical drawings of unusual eye conditions and operative procedures to be used for publication and teaching. This department has also developed

an unusual and active subdivision of ocular prosthetics.

Some sixty odd thousand examinations were performed in the microbiology and clinical pathology diagnostic laboratory of the Eye Institute during the past year. Dr. Deborah Locatcher-Khorazo has completed a study of bacteriophage types of *Staphylococcus aureus* isolated from 525 cases of normal and infected eyes.

The Orthoptic Laboratory completed its tenth year of operation with an orthoptic technician, Miss Sally Moore, in charge dividing her time between the Eye Institute and the Vanderbilt Eye Clinic. Four hundred and ninety new patients were seen during the year.

Under the direction of Dr. Otto Lowenstein the pupillographic laboratory performed pupulograms for diagnostic purposes on individuals referred by various departments of the hospital. Cases with pupillary symptoms pointing to conditions in the diencephalon now cover 880 records. In addition, experimental work on the threshold of pupillary light reflex, the mechanism of the effect of low intensity background illumination upon the pupillary light reflex, and the mechanism of "pupillary flicker fusion" and "pupillary unrest," pharmacological studies on the iris were investigated.

The X-ray Department reported on 716 patients and the Department of Pathology processed 714 specimens, 425 of which were globes and 289 biopsies.

Staff Activities

The clinical staff has ranged widely in a geographical sense giving papers westward to Mexico City and eastward to Moscow. About thirty papers were given in widely scattered areas by our members.

Professor Gordon M. Bruce has remained as Chairman of the American Board of Ophthalmology and Professor Arthur Gerard DeVoe as a member of that Board during the past year.

Professor DeVoe has served as a member of the Ophthalmology Training Grants Committee of the National Institutes of Health, and has recently been appointed to the Special Medical Advisory Group of the Veterans Administration. Professor Charles A. Perera has served as Chairman of the Section on Ophthalmology of the New York Academy of Medicine for the year ending June, 1959. Professor Maynard C. Wheeler was guest of honor at the Canadian Ophthalmological Society in October, 1959, and continues his post as Secretary of the American Ophthalmological Society. Dr. Andrew de Roeth, Jr., as Associate Editor of the American Medical Association Archives of Ophthalmology, is charged with annually surveying advances in pharmacology as they pertain to the eye. Dr. Bruce is concluding his duties as Editor of the Transactions of the American Ophthalmological Society but remains as Consulting Ophthalmologist to the Surgeon General of the United States Navy. Professor Raymond L. Pfeiffer, in addition to speaking before the Mexican Ophthalmological and the Mexican Roentgenological Societies, has continued his services with the New York State Commission for the Blind as Consulting Ophthalmologist and with the New York State Journal of Medicine as Associate Editor. Clinical Professor Algernon B. Reese is President of the American Ophthalmological Society for the present year, was the Howe Lecturer and Exchange Professor at the Harvard Medical School, attended the first North African Seminar in Ophthalmology at Tunis, traveled to Moscow to survey Russian ophthalmology under the sponsorship of the World Federation of Neurologists and, in addition, made numerous addresses throughout the country. His Retinoblastoma Clinic has developed to the point where its reputation is international and its accomplishments unique in the field. It now encompasses most of the eye diseases of infancy and childhood. As a member of this unit, Dr. Robert M. Ellsworth has just returned from Germany where he studied the use of the photo coagulator with particular reference to the treatment of intraocular tumors.

The Knapp Memorial Laboratory of Physiological Optics has proceeded with its program of functional evaluation of the retina in various disease groups. The Retina Clinic, established last

year and attended by an assigned resident, is on a sound basis. Further developments are contemplated, including closer liaison with retinal detachment work which is the major interest of Assistant Professor Graham Clark. Dr. Charles J. Campbell has been appointed a member of the Armed Forces — National Research Council Vision Committee, and with Miss Catherine Rittler, Research Associate, actively supervises the work of the laboratory. Dr. Floyd Farrant, working in the unit, has developed a technique for precise measurement of retinal blood vessels. Recently the laboratory has been joined by Dr. Richard Copenhaver who is primarily interested in the field of electroretinography. Dr. Gertrude Rand, who until her retirement had been a most active participant in the work of the laboratory, was awarded the Edgar D. Tillyer Medal by the Optical Society of America on April 2, 1959.

Research Activities

Research activities have in the past been rather sharply divided into clear cut groups of problems devoted on the one hand to clinical investigation or on the other, to basic research. There has recently been a trend for our younger staff members, primarily clinically trained, to devote more of their time and interests to basic problems related to specific ocular disease. This has had the salutary effect of bringing our research activities and clinical interests into a more unified whole. Dr. Anthony Donn, while carrying on clinical activities and developing a contact lens service, has also been able to demonstrate conclusively in the laboratory that the corneal epithelium actively secretes sodium ions and that the direction of this transport is from the tear fluid into the corneal stroma. The techniques used to uncover these findings were developed during a nine month visit to the Institute of Ophthalmology in London.

In the Glaucoma Clinic, under the direction of Associate Clinical Professor Willis S. Knighton, a long range project comparing visual field and tonographic changes in a group of normal and glaucomatous patients has been under way for approximately five years. The usefulness of newer antiglaucomatous drugs and the comparative value of the applanation tonometer versus the electronic tonometer have been under study. Doctor deRoeth, in addition to working actively in

this clinic, carried out a research project on experimental diabetic retinopathy. He has been able to show a lowered rate of anaerobic glycolysis in the retinas of the diabetic rat as compared to the normal.

During the past year, Dr. Ira S. Jones has collaborated with Dr. Pfeiffer in the clinical work of the X-ray Department, but at the same time has been able to carry out a research project on lymphatic drainage from the orbit.

A clinical study, in conjunction with Dr. Carolyn Denning and Dr. Harold Spalter, has been done by Dr. Bruce correlating ocular pathology with cystic fibrosis of the pancreas.

Professor George R. Merriam, Jr. supervises a regularly scheduled radiotherapy department in the Eye Institute. Additionally, he has been able to carry out a large scale animal experiment verifying the time-dose relationship found in the clinical study of radiation cataracts. Working with Professor Zacharias Dische, he has made a study of the chemical changes produced in the lens of ionizing radiation.

Dr. Robert M. Day's clinical interest in ocular manifestations of thyroid disease has been supplemented with experimental studies on fish in an attempt to identify the hormone which is responsible for eye changes in thyroid disease.

Dr. Frank D. Carroll has continued his investigation of individuals with optic neuritis and is currently making a study of some 250 cases of tobacco-alcohol amblyopia which have been seen during the past twenty-six years.

A uveitis clinic, under the direction of Dr. G. Richard O'Connor and Dr. Robert M. Ellsworth, has been established for the purpose of studying the etiologic factors of both acute and chronic uveitis. From the laboratory standpoint, the group has concentrated its efforts on a study of ocular toxoplasmosis. Immunological investigations have been directed towards the detection of precipitating antibodies to toxoplasma in the serum and aqueous humor of suspected patients using the agar diffusion techniques. The standardization of a hemagglutination test for toxoplasmosis and the development of a new technique for detecting toxoplasma antibodies by means of fluorescein-tagged anti-human globulin serum is being investigated.

In Professor George Smelser's laboratory, two

experiments on exophthalmos have been carried out in collaboration with Dr. Wegelius. In one, a study of the distribution of isotopically labelled pituitary hormones in the orbital connective tissue is being performed with the intent to determine the target cells on which pituitary hormones act to produce pathologic changes in the orbit. In the second experiment, an attempt has been made to determine whether the permeability of orbital vessels is altered in exophthalmos. The reputation of this laboratory, particularly with reference to the basic mechanisms of exophthalmos, is world wide.

In addition, Professor Smelser's studies on the development of corneal transparency are essentially complete and he is at present investigating areas of protein synthesis in the developing eye. In two series of experiments on the metabolism of sulfated mucopolysaccharides in the cornea, he has shown first, by radioautographic methods, that the synthesis of normal corneal connective tissue ground substance is in part dependent upon the existence of an intact epithelium and endothelium. In the second series, corneal vascularization was induced in rats by topical application of alloxan. A study was then made of the fate of pre-existing sulfated compounds from vascularized corneas. In collaboration with Professor George Pappas, Professor Smelser has conducted an extensive series of experiments designed to trace the route taken by material from the capillaries in the ciliary processes to the posterior chamber. Evidence has been obtained indicating that the ciliary epithelial cells may not only be engaged in secretion, but also in absorption of certain aqueous humor components. This suggests a new concept in the formation of aqueous humor.

Professor Dische has continued studies of the synthesis of soluble lens proteins and the formation of albuminoid in relation to processes of aging and cataract formation. He has observed the effect of endocrine and nutritional factors which influence the rate of the metabolic turnover in the body and correlations between these two rates have been established. Experiments on fractionation of protein constituents of the vitreous were begun and, in conjunction with Doctor Merriam and Dr. Anima Devi, a study of the effect of X-ray irradiation on certain metaboli-

cally active constituents of the lens has been carried out.

In Professor Seymour Halbert's laboratory, progress has been made along three major lines of investigation. In conjunction with Dr. W. Manski, investigations of the biochemical composition of the lens have been pursued using immunological methods. At least ten immunologically cross reacting molecular species have been found in various vertebrate lenses. A detailed study of the electrophoretic properties of these immunologically cross reacting components is being carried out in order to obtain information concerning the biochemical evolution of lens proteins. With Dr. Gabriele Ehrlich and Mrs. D. Friedman, antisera have been prepared against cornea, sclera, lens and vitreous in animals. The cytotoxic effects of these antisera are being studied with respect to tissue transplantation rejection in general and corneal transplantation in particular. Studies on the analysis of human streptococcal infections using agar precipitin techniques with human antibodies has continued. It is hoped that some of these materials will be obtained in the near future in the highly purified state for definitive biological studies.

In order to learn certain micro techniques, Professor Virginia Weimar is spending six months in the laboratory of Dr. Oliver H. Lowry at Washington University in St. Louis. She plans to utilize these techniques in our laboratories on her return.

Professor Clifford Harding has developed a method of studying tritium labelled thymidine incorporated into the lens epithelium of the rat. It is planned to employ this method in a study of the effects of certain cataractogenic agents on the lens.

In the Electronmicroscopy Laboratory directed by Professor George Pappas, the general

phenomenon of fluid transport is being studied. The three principal areas of investigation include the ciliary epithelium of the eye, the choroid plexus and fluid movement in free-living amebas. In a study of certain aspects of aqueous humor dynamics with the aid of the light and the electronmicroscope, changes in the fine structure of the ciliary epithelium brought about by various agents which alter normal aqueous formation have been noted. In addition, the morphogenesis of the ciliary process and the nature and development of the zonular fibers are being studied.

The department has had numerous short term visitors from this country and abroad. In addition, observers from India, Korea, Japan, Iraq, Mexico and Africa have remained with us for periods varying from two months to a year in the capacity of visiting fellows. These men are usually clinically trained and rarely take part in research projects, their object being to observe teaching and clinical methods in order to train clinical practitioners in their own countries.

We are indebted to many for their generous financial aid. We wish to express our deep gratitude to those who have supported our activities, among whom are Mrs. C. Jean Brush, Mr. Cornelius Crane, Gleich Foundation, Griffis Foundation, Mary W. Harriman Fund, Mr. Bob Hope, Lillia Babbitt Hyde Foundation, Knights Templar Foundation, Jack Kriendler Memorial Foundation, Lackneer Corporation, Life Insurance Medical Research Fund, Mortimer and Harriet Marcus Foundation, Dunlevy Milbank Foundation, National Council to Combat Blindness, Inc., New York Foundation, Inc., New York Heart Association, Mr. A. G. Pratt, Snyder Ophthalmic Foundation, The Seeing Eye, Inc., Whitehall Foundation and the United States Public Health Service.

Orthopedic Surgery

FRANK E. STINCHFIELD, *Professor and Chairman of the Department
Director of Service*

The New York Orthopedic Hospital has attempted to maintain a balance between care of patients, teaching and research.

It has become increasingly evident that in this era of concentrated research we must now evaluate and control the amount of time, space and personnel allotted to research, whereas but a few short years ago we were willing to give almost unlimited space and facilities to this branch of our specialty. The results of this research have, however, justified the importance placed upon it.

The ward and semiprivate services have been filled to capacity at all times. The private service has increased its numbers, and rarely is there a bed available unless a reservation is placed two to four weeks in advance.

During 1959, there were 2,930 patients admitted to the Orthopedic Service, including 837 fracture cases. There were 2,172 operative procedures performed, of which 730 were fracture cases.

As the Associated Hospital and other insurance plans become more universal, it becomes increasingly difficult to train orthopedic residents in the art of surgery and the time may well be approaching within a few years when some plan must be devised to allow residents training while operating on insurance plan patients.

Our ever present lack of sufficient surgery of trauma is one of our main causes of worry. Unless an ambulance service is made available, it would seem that our training in trauma must almost of necessity be limited to the walking injured. It is to be hoped that some day this deficiency may be rectified.

For a service to remain progressive, new concepts must be conceived, carefully planned and executed. It is with this idea in mind that we are now coordinating our basic research with its clinical application and, to date, it has been exciting, stimulating and refreshing to see some of the basic thinking now contributing to clinical success.

Research Activities

Within the past year Dr. Irwin Clark, Assistant Professor of Biochemistry (Orthopedic Surgery), has joined our staff, and has aided greatly in the advancement of our research work. Professor Clark has been working on comparative effects of hypervitaminosis A and D upon bone resorption in normal and parathyroidectomized rats. He also has determined the relative rates of removal from bone of calcium, phosphorus and sulphur after the administration of citrate and magnesium ions. In addition, he has studied the long-range causes in development of osteoporosis in experimental animals. One of the most interesting and challenging problems with which he has worked is the relationship between the salivary glands and bone metabolism.

Dr. Lloyd A. Hurley, a third year resident, has continued his previous studies on ethylenediamine-treated bone as a graft material, sharply defining its clinical application. He is instituting intensive investigation in the anatomy of the macro-canalicular system of bone.

Dr. James H. Hardy, III, a Junior Annie C. Kane Fellow, is studying the relationship between adrenal and parathyroid insufficiency in rats.

Professor C. Andrew L. Bassett has continued to work with Dr. James B. Campbell, Assistant Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, on the studies of Millipore in neural regeneration, and for their outstanding work, they received the National Award of the Paralyzed Veterans of America.

One of the chief fields of research is to try to define the cells and environmental circumstances involved in bone formation. This work has been pursued both in animals and in tissue culture.

Drs. Hurley, Frank E. Stinchfield and Bassett have done some original basic research on the role of soft tissue in osteogenesis whereby it was shown quite conclusively that to nurture a growing bone in spinal fusion, tissue fluids are the most important factor that is required, and that tissue

cells, other than osteoblasts, may act as a hindrance to bone healing.

The Bone Bank has continued to supply from 1,000 to 1,200 specimens for bone grafting during 1959. Over the past several years, we have received innumerable requests for information as to how to "set up" a bone bank. With time and experience, we are becoming increasingly aware that bank bone cannot replace autogenous bone, and it is quite evident that autogenous bone is still the most satisfactory type of grafting bone when such bone is required. The Bone Bank thus becomes a useful adjunct only when sufficient autogenous bone is not available.

Professor Halford Hallock has continued his interest in poliomyelitis and, with Dr. Ryder, has continued a study on the effect on growth of spinal fusion in young children.

Professor Harrison L. McLaughlin continues to devote almost his entire time and efforts to the field of trauma, including participation in many symposiums and panels dealing with this specialty. During the past year, he was elected Chairman of the Committee on Trauma of the American College of Surgeons, and President-Elect of the American Association for the Surgery of Trauma. He was the editor of a monograph on trauma. With one exception, all contributors to this book were past or present members of the Medical Center staff.

Professor Robert E. Carroll's major interest is in the field of hand surgery. 850 patients were seen in the orthopedic hand clinic during 1959, 216 of whom received reconstructive surgery.

Professor Charles S. Neer is working on the basic problem of recurrent bone cysts.

Dr. Garcia has continued his interest in the treatment of fractures in the aged and, together with Dr. George B. Ambrose and Dr. Neer, has done considerable work on fractures about the hip. Dr. Ryder has been appointed chief of the children's orthopedic division and is making a special study of congenital dislocations of the hip.

Dr. J. William Fielding has continued his work in scoliosis and has furthered his original work in cineradiography. Dr. Fielding is presently secretary of the Section on Orthopedic Surgery of the New York Academy of Medicine. Together with Mr. George N. Tanis, Dr. Fielding has developed an excellent photographic laboratory.

Professor Frederick S. Craig has continued his work on the problem of the plantar flexed talus, and has prepared an exhibit on this very difficult and previously discouraging clinical problem. Dr. Craig has recently been appointed as orthopedic consultant to the Chest Service, First Surgical Division, Bellevue Hospital. This is for the purpose of aiding in the complete understanding and clinical care of tuberculosis of the bone. It is felt that the problem of bone tuberculosis can best be handled by a close medical and orthopedic liaison.

Professor Melvin B. Watkins has continued his interest in the low back, at present being actively engaged in a clinical research problem on the results of multiple low back operations.

Professor Everett C. Bragg is studying the correlation of X-rays, discograms and tissue specimens of autopsy cases.

Professor Sawnie R. Gaston has maintained his interest in club feet and low back problems. He is at present chairman of the New York and Brooklyn Regional Committee on Trauma of the American College of Surgeons.

Dr. Ambrose is now working with Dr. Carroll in the orthopedic hand clinic and is currently interested in developing a technic for interphalangeal joint arthroplasty and arthrodesis.

Professor D. Keith McElroy has maintained his interest in the care of the cerebral palsy child and has done considerable work on evaluating the end-results of the various surgical procedures in these individuals. He has also carried on his investigations relative to drug therapy in tuberculosis.

Dr. Alan DeForest Smith, Professor Emeritus of Orthopedic Surgery and Consultant Orthopedic Surgeon, and Dr. William H. von Lackum, who retired in 1958 as Assistant Clinical Professor and Associate Attending Orthopedic Surgeon, continue to give unstintingly of their time and valuable experience in helping to teach both at the undergraduate and at the resident level. The entire service is, indeed, grateful for their help and loyalty.

Dr. Frank E. Stinchfield received the Distinguished Merit Award from Northwestern University Medical School at their Centennial Celebration in 1959. He was also elected to the American Surgical Association.

Staff Changes

Dr. Alexander D. Pappas resigned late in 1958, to devote more of his time to the Institute for the Crippled and Disabled.

Dr. Chauncy H. Dobson, who completed a Junior Annie C. Kane Fellowship here in the Fall, has joined the orthopedic clinic staff.

Dr. Barbara B. Stimson, a member of the Presbyterian Hospital staff from 1928 to 1947, has been reappointed as Assistant Clinical Professor of Orthopedic Surgery.

Dr. Neer was appointed Visiting Orthopedic Surgeon to Delafield Hospital as of January 1, 1959.

The following promotions were effective July 1, 1959: Dr. Bassett from Instructor to Assistant Professor; Dr. Ambrose, Dr. Garcia and Dr. McElroy from Associate to Assistant Professor.

Alumni

The thirty-third annual meeting of the Alumni Association of The New York Orthopedic Hospital held here in April was exceptionally well attended. Dr. Philip D. Wilson, Director of Research and Education and Surgeon-in-Chief Emeritus of the Hospital for Special Surgery, gave the third Alan DeForest Smith lecture on Surgical Reconstruction following Resection for Tumor.

Requests for the BULLETIN of The New York Orthopedic Hospital, now in its third year of publication, continue to be widespread. Dr. Hallock is editor and Dr. Neer and Dr. Ryder, assistant editors of the BULLETIN.

One would be remiss if proper recognition and appreciation were not expressed to our alumni. They have been most loyal and helpful, and, in the past year, have contributed \$2,245 to our research fund. It again illustrates how a united alumni help to continue investigation in the field of research by their own contribution. We are most grateful.

Service Activities

Over the past year there has been an ever increasing number of visitors, visiting fellows and colleagues to our service, and it is a constant source of enjoyment to have visitors join in the free discussion of both our research and our

clinical activities. Attendance at national meetings and presentation of prepared papers both at local and national levels, have constantly increased. Usually, there are at least two and sometimes three prepared papers from The New York Orthopedic Hospital presented at each national orthopedic or surgery of trauma program.

Acknowledgment

No service can long exist without financial backing if it wishes to be progressive and original in the field of research. We are especially indebted to the Martha and Spencer Love Foundation for the initial contribution to our research effort. Much of the research in relation to the use of Millipore in studying osteogenesis in relationship to soft tissue and the investigation of environmental circumstances favoring bone formation has been made possible because of their willingness to underwrite our original attempts. Their continued support has made it possible to carry out further investigations which now are being utilized in clinical problems.

The contributions of Miss Katherine Patterson, Mrs. Frances B. Clark, Mrs. Oliver D. Filley, Mrs. Bernard E. Smith, and the Messrs. Herbert Allen, Snowden Andrews, Charles P. Cooper, Jr., Eben M. Graves, Arthur H. Lamborn, Robert Lehman, Charles S. Munson, De Witt Wallace and Kresge Foundation; Sidney J. Weinberg, the estate of Ruth F. Weinberg and others have all been of tremendous help. It can surely and safely be said that voluntary individual contributions have made it possible to carry on a very active research program which otherwise would not have been realized. We shall be forever grateful and trust that our endeavors and results will justify the confidence placed in us.

We are also extremely grateful for the continued support of the United States Public Health Service, the Easter Seal Research Foundation, E. R. Squibb and Sons, and the Office of Naval Research.

Women's Auxiliary

The Women's Auxiliary of The New York Orthopedic Hospital has remained active and has at all times been most helpful. There is no more loyal group of individuals dedicated to the ideals

of New York Orthopedic Hospital than this Auxiliary.

Deep appreciation is expressed to the attending

staff, nurses, residents, secretaries and all personnel who have helped in the functioning of the department and service.

Otolaryngology

EDMUND P. FOWLER, JR., *Professor and Chairman of the Department*
Director of Service

Service Statistics

During 1959, 6,305 patients of which 1,984 were new patients were treated in Vanderbilt Clinic. There were 1,685 admissions to the Presbyterian Hospital and 216 to Harkness Pavilion with a total of 1,304 operations. There were 1,149 admissions to the Babies Hospital with 1,020 operations. There were 535 consultations on the other services of the Presbyterian Hospital. This constitutes an increase in patient load both in the Outpatient Department and occupancy of hospital beds with a slight decrease in attending staff. There was an increase in resident help through the inclusion of two United States Public Health Service Fellows.

Service Activities

In the operating room, the use of the sterile operating microscope for more and more types of ear surgery was apparent. Greater salvage of hearing in radical mastoidectomies is the goal. Meanwhile improved diagnostic observation of the drum head was achieved both with the use of the microscope and the magnifying otoscope of Hallpike. Experiments are under way in the use of student demonstration of lesions in the nose and larynx, as well as motion pictures and television observation through the coaxial lighting system of this same microscope, using the lower powers. The modernization of the otolaryngological operating rooms on the eighteenth floor is noteworthy because of the sound damping and arrangements for providing constant temperature saline irrigation, not to mention ultrasonic cleaning of the small ear, nose and throat instruments.

Staff Activities

After many years of faithful active service, Prof. George V. Browne has retired. Prof. James Babcock, who assisted for many years in the Group Clinic and in Medical Information even after his retirement, resigned to join the Veterans' Administration staff. Only when these men

stopped giving their services was it apparent just how much work they had been doing for the last several years. Entering the Department were: Dr. Stanley Whitfield, geographically full time, and Dr. Peter Westerhoff. Dr. Alvin Novack of the Head and Neck Division has been assigned from general surgery.

Major contributions to the Department of Otolaryngology in the year 1959, were from: The Central Bureau of Research of the American Otological Society for studies of otosclerosis; the Philip H. Hiss, Jr. Memorial Fund for studies in microbiology; Deafness Research Foundation for study of the incidence of hearing loss and the study of congenital anomalies; Merck, Sharp & Dohme for microcirculatory studies and the William B. Douglass Fund for support of a research worker in otolaryngology. The United States Public Health Service provided a training grant for residents. Also they made a grant to the St. Joseph's School for the Deaf for study of children with dysacusis. Prof. Edmund P. Fowler, Jr. is co-investigator of the project and virtually all of the children are studied first in the Hofheimer Speech and Hearing Clinic.

Prof. Franz Altmann has been actively working with Prof. Jules Waltner and Dr. Milos Basek on the application of ultrasonics to the labyrinth for Meniere's Disease. He reported his observations to the American Otological Society and the American Academy of Ophthalmology and Otolaryngology. He also reported his histological findings in stapes mobilization procedures to the Collegium Otolaryngologicum in Vienna and the Committee on the Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology.

Prof. Daniel C. Baker, Jr. was elected Vice President of the American Broncho-esophagological Association and Chairman of the Section of Otolaryngology in the New York State Medical Society. He is serving on the American Board of Otolaryngology and the Advisory Council of

the American College of Surgeons. In addition, he continues on the Residency Review Committee representing the American Medical Association. He has been active studying and discussing at meetings laryngeal subjects, notably laryngeal cancer and laryngeal disturbances in industry, obstruction of the esophagus and, with Dr. Waltner and Dr. Novick, the surgical treatment of posterior choanal atresia.

Dr. Milos Basek was a guest speaker at the Georgia Ear, Nose and Throat Society where his subject was Treatment of Meniere's Disease with Ultrasonics and Recent Advances in Stapes Mobilization. He also took part in a panel discussion on tonsillectomy and adenoidectomy for the Speech Association of the Eastern States. Associated with Dr. Altmann, he discussed the histological studies of stapes mobilization. He has continued with Dr. Milos Lotta his studies of the effects of Ultrasonics on the labyrinth of cats and is developing an American made machine for human use in Meniere's disease. Meanwhile, he has been working on the new bone formation in the middle ear from infection.

Prof. John J. Conley moderated a panel on head and neck surgery in the Eastern Section of the American Rhinological, Laryngological and Otological Society. He lectured and gave Mid-winter seminars at the University of Florida in postgraduate medicine. He also addressed the Society of Head and Neck surgeons in Washington, D. C. as well as at the University of Indiana. He gave a course in head and neck surgery, lectures, movies and demonstration of operations for the Post-graduate Medical Association of Sydney, Australia and then went on to lecture in Manila, Hong Kong, Teheran, Tel-Aviv, Beirut, Athens and Lisbon. In London, he read a paper to the International Congress of Plastic Surgeons on nerve grafts. Other groups for whom he read papers were: The James Ewing Society, The American College of Surgeons, The American Rhinologic Society, The American Speech and Hearing Society. He is continuing his research on both rehabilitation on the post-laryngectomized patient and swallowing functions following radical surgery on the head and neck.

Dr. Thomas Fay of the Audiology Department has been assisting both Mr. Richard Chase on his studies of delayed auditory feedback and Dr.

Edmund P. Fowler Jr. in collecting material on the type and incidence of hearing impairment in a general hospital population. He is also consultant on the St. Joseph Project for Dysacusic children and the New York Department of Handicapped Children investigating hearing loss in children. His research and activities, in addition, include the rehabilitation of children with hearing impairment and methods of hearing aid evaluation.

Dr. Fowler served as Chairman of the Microcirculatory Conference, Otosclerosis Study Group and the Section of Otolaryngology of the New York Academy of Medicine as well as the Audiometer Committee of the American Academy of Ophthalmology and Otolaryngology. He also is active on committees for audiometric standards for the American Standards Association and the Committee for Hearing and Bioacoustics of the National Research Council. In his microcirculatory laboratory, where controlled hamster cheek pouch preparations have been developed, data show interesting changes in circulation from infection and from the use of antihistamines and antiserotonins. In cooperation with Mr. Charles Morris, he continues his search for the etiology of otosclerosis. Another activity was the study of the use of television in medical teaching. Clinical studies include medical treatment for complications of the common cold; the treatment of sudden deafness with Dr. Stuart W. Cosgriff, Assistant Professor of Clinical Medicine and Assistant Attending Physician and the surgical treatment of persistent Bells' Palsy.

Mrs. Shulamith Kastein presented a paper at the Community Council of Greater New York on the workshop on education of the multiple handicapped child and another on differential diagnosis of children with dysacusis was delivered in Wiesbaden, Germany at the World Congress of the Deaf, and at the American Academy of Ophthalmology and Otolaryngology meeting in Chicago. "The Diagnosis and Training of Children with Dysacusis" was the title of her paper at the Annual Convention of the American Speech and Hearing Association in Cleveland in November, 1959. At the New York Society for Speech and Voice Therapy, Mrs. Kastein gave a report on a study of children with communication disorders.

Dr. Bela Marquit attended a meeting of the

American Otorhinological Society for Plastic Surgery in conjunction with the University of Mexico and the Mexican Otorhinologic Society. At that time he gave a paper on natural and artificial implants, in Mexico City.

Professor Jules Waltner lectured on the basic physiology of the inner ear and ultrasonic treatment for Meniere's Disease at the Spring Congress of the Gill Memorial Clinic in Roanoke. He is preparing material on atresia of the coanae with Drs. Baker and Novick. He is also reviewing the long-range follow-up of nonchromaffin paraganglioma patients. He was the first to diagnose the condition clinically many years ago.

Dr. Stanley Whitfield has been working on the production of anomalies in amblystoma. He rearranged the teaching service for residents and attendings and has written a manual for the guidance of ear, nose and throat residents. He at-

tended a workshop in Chicago on fenestrations, mobilizations and tympanoplasty.

Dr. DeGraaf Woodman finished twenty-five years of teaching the head and neck dissection course in basic science to more than 300 ear, nose and throat residents from this Hospital, Memorial Hospital, as well as affiliated hospitals. He gave a course at the American Academy of Ophthalmology and Otolaryngology on glottic obstruction and discussed Dr. Priest's paper on 309 laryngoscopies under general anesthesia. He has also been doing research with Dr. M. Jack Frumin, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist, on the use of apnoeic oxygen diffusion techniques used in laryngoscopy which permits unobstructed view of glottis without interfering tubing in the glottic chink.

Pathology

HARRY P. SMITH, *Delafield Professor and Chairman of the Department
Director of Service*

The Chairman of the Department of Pathology in the University has served concurrently as Director of the Pathology Service at the Presbyterian Hospital for over fourteen years. He will retire from active duty at the end of the academic year 1959-60. He looks with satisfaction at the long list of able pathologists who have received their training in the department. Several have accepted headships of teaching departments elsewhere; others are also qualified for such responsibilities. Professional recognition has come to the Department at all levels of rank. The Chairman, while at Columbia, has served as President of two of the national associations of pathologists and as a member of the governing board of a third. His associates in the department have published extensively and have participated effectively in the scientific activities of national professional and scientific organizations.

From an operational point of view, pathologists throughout the country have always had the main responsibilities for surgical pathology and for conducting the autopsy services. In recent years they have also had increasing responsibility for the operation of hospital laboratories in various branches of clinical pathology. Members of our own department have consistently assumed leadership in these newer types of activity, thus helping to create and utilize new tools—tools which are essential to the description of disease mechanism in modern terms. Progress along these lines has been slow, however, because of undue persistence of older traditions which called for fragmentation of service laboratories and control of the fragments by other departments. It has been impossible to secure proper coordination of the isolated fragments. As a result, the teaching of students and the training of young pathologists has suffered. Fortunately, progress toward integration has been made within the past two years. Continuation of this trend should bring about notable improvement in teaching and research as well as in the care of patients.

A review of the department's scientific and educational progress of the past eighteen months includes the activities of the various divisions of which the Department is composed. The Division of General Pathology operates as a central agency, with major responsibilities for basic research and for undergraduate instruction. It also has major responsibility for the recruitment of young physicians into the field of pathology. The senior staff of this division serves to stimulate and guide the activities of those who enter the field of pathology. Their role is similar to that of professors who lead graduate students of physics and chemistry to and beyond the level of the Ph.D. degree. In our Division of General Pathology, Professor Wellington B. Stewart provides stimulus to a group of young men through collaboration in several types of research. His basic work on iron metabolism in animals provides an example. He and Dr. Augustus L. Middleton are placing increasing emphasis on the role of gastric juice in promoting the absorption of iron from the alimentary tract. A second project, carried out in collaboration with one of the full-time student fellows, Mr. Robert C. K. Riggins, centers about new techniques for localization of bleeding sites within the gastro-intestinal tract. Professor Stewart and Dr. William Gross of the Department of Radiology (Radiological Research Laboratory) are also associated with one of our third-year residents, Dr. John G. Gorman, in the development of equipment designed to measure prothrombin time objectively through a process which is automatic in nature. Dr. Stewart is Secretary-Treasurer of the Columbia Chapter of Sigma Xi, the honorary scientific society of the physical and biological sciences.

Professor Fred V. Lucas has also conducted research of great merit, and has served as a focus for research on the part of medical students, interns and residents of the department. The program has been outstanding in the study of oxidative enzyme systems present in proliferating

tissues. He and his associates have also made notable progress in their studies in the various types of hemoglobin found in red blood cells of the dog.

The studies on pulmonary vasculature carried out by Professor George P. Vennart and a former Resident of this department, Dr. Richard L. Naeye, have been completed. Professor Vennart is now collaborating with Professor Lucas and with Dr. Charles Ragan, Professor of Clinical Medicine and Associate Attending Physician, in a comprehensive study of the changes which are taking place in the natural history of rheumatoid arthritis.

As has been stated, the interns and residents are participating actively in research, usually in collaboration with senior members of the department. In addition, Dr. Donald A. Lindberg has joined with Mr. Robert Riggins, a student fellow, in studies on the production of pneumonia by gram-negative bacteria. They benefit from consultation with members of the Department of Microbiology.

Another Resident, Dr. Hubert J. Van Peenen, in collaboration with Professor Daniel W. Benninghoff, has made a study of the presence of trace metals in various types of hepatic disease. A second Resident, Dr. John J. Di Re has investigated the effects of irradiation on the lung. A third, Dr. Earl B. Byrne, has produced hydronephrosis in rats and is studying the effects on production of red blood cells. A fourth Resident, Dr. Eric A. Schenk is continuing his earlier work on tumors composed of mast cells. Work of the other two Residents, Dr. Gorman and Dr. Middleton, has been mentioned already.

The Division of General Pathology is enthusiastic about the research of its Resident Staff, for it is from the residents that the academic pathologists as well as the laboratory practitioners of the future must be recruited. The Department is equally enthusiastic concerning its success in stimulating research among undergraduate medical students. Such research introduces creative scholarship at an early stage of the student's career. Experience, here and elsewhere, proves that this is a most effective method of introducing academic viewpoints. The two full-time student fellows now assigned to the department, Mr. John Sheagren and Mr. Robert C. K. Riggins

have followed in the footsteps of the last year's student fellow, Mr. Paul Graham. Mr. Sheagren is studying lesions of the adrenal in patients having chronic hypertension. Mr. Graham, whose term of service extended through the first six months of the period covered by this report, worked with Professor Lucas on the latter's program on oxidative enzymes.

Professor Henry S. Simms, of the Division of General Pathology, has transferred much of his activity to new quarters in the College building. The studies on lipofanogen and anti-lipofanogen have progressed. Recent findings indicate to Professor Simms that the serum cholesterol levels may not be a reliable index of fat deposition in arteries.

Dr. Hans Kaunitz has continued his investigations concerning the biological effects of oxidized fats. Some very interesting results have been obtained and are soon to be published. A comparison of the effects of medium and long-chain tryglycerides has been continued and several publications have resulted. This last mentioned work was carried out in collaboration with Dr. Charles A. Slanetz, Curator of Animal Husbandry and Scientific Director of the Institute of Comparative Medicine, and Dr. Vigen Babayan. Drs. Slanetz and Lester Geller collaborated with Dr. Kaunitz in studies on electrolytes.

The segment of the department located at the Francis Delafield Hospital is closely related to the Division of General Pathology, but is concerned mainly with problems of cancer. Dr. Arthur Purdy Stout, Professor Emeritus of Surgery, Consultant in Pathology to the Delafield Hospital, has been reviewing malignant diseases of childhood in collaboration with Drs. Diane Crocker, Shirley Kaufman and Werner Dutz. Professor Stout and Dr. John Gorman have completed a study of mixed tumors of the skin. Professor Stout and Professor Edith Sproul have also continued their study of prostatic carcinoma.

Professor Sproul, in collaboration with Dr. Elfriede Kohout, has continued studies of hypercalcemia in malignant diseases. Professor Sproul has been attempting to improve techniques for the cytological diagnosis of lung cancer by stimulating the production of sputum. She has also collaborated with Dr. Perry Hudson, Associate Clinical Professor of Urology, on problems deal-

ing with reducing the bacterial content of the hospital environment.

Dr. Silvio Fiala, at the Delafield Hospital, has continued his studies of carcinogenesis. He is also studying the synthesis of desoxyribonucleic acid.

Dr. Gleb Budzilovich has completed studies of Wegener's granulomatosis. Doctor Shirley Kauffman has studied the production of embryonic malformations caused by urethane injections.

The Divisions of Neuropathology, Orthopedic Pathology and Pediatric Pathology are specialized divisions whose activities are closely related to those of the corresponding clinical departments. The staff of these divisions, almost without exception, are individuals who have had broad basic training in general pathology. They collaborate in the instruction of undergraduate students and in training of Residents in pathology, neurology, neurological surgery, orthopedics and pediatrics. The first of these divisions, neuropathology, has a very active program for "trainees" in this field of specialization. Many pathologists, so trained in neuropathology, have moved on to posts of responsibility in other institutions. Professor Abner Wolf, Professor David Cowen and Doctor Lester M. Geller of the Division of Neuropathology are deeply involved in studies of diseases of the nervous system in the perinatal period of life. Professor Wolf, Professor Cowen and Doctor John Potonos have pub-

lished their findings on the reaction of glial cells and nerve cells to Nitro-B-tetrazolium. Dr. Joo H. Sung, Senior Research Fellow of the National Institutes of Health, is continuing his studies on the late effects of irradiation on the brain. Doctor Sheila Donahue has undertaken an exhaustive study of the neonatal brain of the rat with aid of the electron microscope.

The Division of Orthopedic Pathology, under the direction of Professor C. Zent Garber, has continued studies on the mechanics of blood flow in diseased bones. His associate, Mr. A. S. Said, has published extensively on the physical characteristics of chromatographic columns.

The Division of Pediatric Pathology conducts a program of teaching, research and hospital service, all in close collaboration with the Department of Pediatrics. Dr. Dorothy H. Andersen, Professor of Pathology (Pediatrics) and Assistant Attending Pediatrician, has collaborated with Professor William A. Blanc on a long-term study of cystic fibrosis. They have published several papers on the subject. Professor Blanc has also published results of his research on kernicterus and congenital malformations. He is also a member of a group which is studying the etiology of cerebral palsy. Professor Blanc served as the official representative of Columbia University at the 400th Anniversary Celebration of the University of Geneva.

Pediatrics

RUSTIN MCINTOSH, *Carpentier Professor and Chairman of the Department
Director of Service*

This is the last annual report which the present Chairman of the department and Director of service will have the privilege of submitting. In the twenty-nine years of his incumbency, pediatrics, as a clinical discipline, has undergone an almost revolutionary evolution in several of its aspects: in its concern for the child as an individual, rather than for the illness with which he is afflicted at the time when his parents seek professional advice; in its growing appreciation of the continuous interplay between a child's emotional state and his manifestation of symptoms or signs of disturbed health; in the expansion of its body of knowledge concerning matters of health; and in the increasing objectivity and reliability of the sorts of evidence which can be assembled to form the basis of a clinical decision. The last-mentioned general area of concern has to do largely with the contribution of the methods and skills of basic science to the solution of clinical problems — in other words, with the role of the laboratory in the day-to-day operation of a hospital, a clinic or an office practice. Without question this is the area which has undergone the most rapid and effective exploitation in the past generation in clinical medicine as a whole; it has been chiefly responsible for advances in the speed and accuracy of diagnosis, in the understanding of the processes which underly health and disturbances of health, and in the development and application of prophylactic and therapeutic agents and procedures. Whether the opportunity for exploiting the contribution of the laboratory to the advance of pediatrics has been fully grasped here at the Columbia-Presbyterian Medical Center is another question. Over the years notable discoveries have emanated from our pediatric laboratories, have been appreciated throughout the world and have been announced with understandable pride in these annual reports. This is not the same as to say that our achievement has matched our opportunity — the opportunity for discovery which we might have had if our laboratory facilities had

been permitted to grow as rapidly as the development of basic science called for. On the other hand, the contributions to pediatric knowledge which workers in our laboratories have succeeded in making have been actually greater than might have been expected from the limited resources available.

It is with deep regret that I report the death of Dr. Charles A. Lang, former Assistant Attending Pediatrician in Babies Hospital and, at one time, Chief of Clinic of the Pediatric Division of Vanderbilt Clinic; and of Dr. Hermann Vollmer, Assistant Pediatrician, Vanderbilt Clinic. Dr. Lang had been Chief Resident in Babies Hospital under Dr. L. Emmett Holt, Sr., half a century ago; he had retired from active service in the hospital in 1948 but, despite slowly failing health, had continued in practice almost up to the time of his death. Dr. Vollmer, a refugee from Nazi Germany in the '30s, had been a faithful worker in Vanderbilt Clinic for more than twenty years. To both men, tribute is due as loyal members of the pediatric staff.

Dr. John B. Ahouse, Instructor in Pediatrics and Assistant Attending Pediatrician, reached retirement age and was transferred to the inactive list in July, 1959. Dr. Saul Blatman, Instructor in Pediatrics and Assistant Attending Pediatrician, resigned in June, 1959, to accept an appointment as Director of the Pediatric Service in the National Jewish Hospital of Denver. Dr. Paul A. di Sant'Agnese, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, resigned December 31, 1959 to become Director of Metabolic Studies in the clinical service of the National Institute of Arthritis and Metabolic Diseases of the United States Public Health Service in Bethesda, Maryland. Dr. Conrad M. Riley, Associate Professor of Pediatrics and Associate Attending Pediatrician, resigned likewise at the end of the calendar year; he will have full professorial rank in the University of Colorado School of Medicine and will be chief of the Pediat-

ric Service of the Denver General Hospital. The loss of close association with these colleagues of many years, all of them skilled teachers and investigators and masters of the clinical art in pediatrics, is mitigated only in part by appreciation of the positions of honor and responsibility which they are to assume.

Dr. L. Stanley James was promoted from Instructor to Assistant Professor of Pediatrics, his clinical appointment remaining that of Visiting Fellow in the Service of Anesthesiology. Dr. Alfred L. Florman, of the staff of Mt. Sinai Hospital, was promoted from Instructor to Assistant Clinical Professor. New appointments include those of Herbert I. Cohen and Marguerite J. Gates as Assistants in Pediatrics and Assistant Pediatricians; Walter L. Henley and Leonard Steinfeld, of the Mt. Sinai staff, as Instructors; H. Gregory Jameson as Assistant Professor of Pediatrics with clinical appointment in the Radiology Service. Dr. Herbert S. Hurwitz was appointed Assistant in Pediatrics. Professor Ruth C. Harris returned from leave on March 1, 1959.

Patient Care

No significant change has appeared in recent months in the demand for pediatric care as measured by total patient admissions to the hospital service, number of patient days' care, or by newcomers to the Pediatric Division of Vanderbilt Clinic and return visits of old patients.

During 1959, the Pediatric Service provided 57,992 days of care for 5,163 patients; in the outpatient clinic 50,513 visits were made by 9,568 patients.

At certain seasons of the year, especially soon after the opening of the elementary school term in the autumn and shortly following school closing in late spring, the demand for admission to both the ward and semi-private services taxes the hospital's resources to the utmost and confronts the admitting service with an almost unbroken succession of difficult situations. Fortunately it has never been necessary to refuse admission of any manifestly and acutely ill child, but in such times of crisis, the hospitalization of less urgent cases must often of necessity be temporarily deferred. The burden of utilizing our private and semiprivate patient facilities equitably falls largely on the shoulders of Miss Elizabeth Callahan,

Unit Manager for the Pediatric Service, and credit must be accorded to her for fairness and complete objectivity in making certain that the welfare of the patient always receives foremost consideration.

The organization in September, 1959, of a pediatric cardiopulmonary diagnostic laboratory under the combined supervision of the Radiology Service in the hospital and the Department of Pediatrics in the medical school, has made it possible to accelerate the evaluation of children with heart trouble and with impaired respiratory function. This important diagnostic resource, established through the generosity of the Hartford Foundation, is under the immediate supervision of Professors Sidney Blumenthal and A. Gregory Jameson.

For some years, New York has lagged behind other metropolitan centers of the country in the development of pediatric surgical specialists. Professor Thomas V. Santulli's decision, reached during the past year, to confine his work to patients of the pediatric age group is welcomed by his pediatric medical colleagues as an important step in the direction of improved patient care.

In recognition of the heavy work load of the house staff in pediatrics, the addition of two assistant residents in pediatrics was authorized. This is a highly desirable improvement, and one which will help both the patients and the teaching program.

Teaching

One test of the competence of teaching is the record which students establish in taking examinations. Columbia students taking Part II of the National Board Examinations in medicine have in the past few years established an outstanding average record in pediatrics. The importance which one might attach to such a criterion of success depends in large part on the type of examination given and on the effort the student puts into his own performance. National Board Examinations are carefully designed so as to test habits of clinical thinking, rather than stores of factual information gained by last minute cramming. Moreover, medical students are said to make a point of taking these tests in their stride, without special study. If this is true, then the results are gratifying in showing that the informal,

tutorial type of instruction put into effect in 1951, when the third and fourth year curricula were extensively revised, continues to bear fruit.

Results of this kind are not obtained without paying a proportionate price. In order to put this program into effect, it has been necessary to call on the services of a large number of clinical teachers and to carry on throughout the entire calendar year with minimal time out for vacation. For the teaching staff, this has meant the reduction of the traditional academic summer vacation to approximately one month for each instructor of all ranks. Over the long pull, the burden of the long teaching year shows up in fatigue on the part of the instructional staff, with resulting loss of the spark necessary to maximal effectiveness; and in the long run, it also subtracts from productivity in research. The obvious dilemma is currently being studied by the Committee on Instruction of the Medical School.

Research

Under the guidance of Professor Hattie E. Alexander, fundamental studies in microbiology have been carried out. With Dr. Katherine Sprunt and Miss Winifred M. Redman, she has repeatedly demonstrated in cells in tissue culture the creation of a virus strain which combines some of the antigenic traits of both type 1 and type 2 poliomyelitis viruses, with which in their partially purified form the experiments had been begun. The new virus particle has been shown to be neutralizable by either type 1 or type 2 antiserum. Moreover, impressive evidence has been amassed to support the contention that it is stable and capable of propagation through at least seven generations without significant change of characteristics. This strongly suggests that the alteration which leads to the new virus particle has been brought about by a chemical change in its genetic constitution. In a related study of the characteristics of the cells used in tissue culture for viral work of this type, the same group of investigators showed that different lines or strains of cells can be propagated, exhibiting various degrees of susceptibility to the infecting virus. Despite their common origin from the same tissue, individual strains not only manifest a characteristic susceptibility but also retain this trait unchanged through as many generations as have been stud-

ied. The demonstration that the vulnerability of a cell to a particular virus is genetically determined is in itself of interest; it has also paved the way for technical improvements in virus identification and assay. An extension of the work reported last year, in which Dr. Alexander, Dr. Sprunt and Miss Redman produced whole poliovirus by exposing susceptible cells in tissue culture to a partially purified ribonucleic acid derived by chemical fractionation of the original virus, has led to the application of analogous methods to ribonucleic acids derived from a variety of other viruses, specifically three separate strains of Coxsackie virus and two from the Echo group. In all instances, whole virus, capable of infecting and destroying susceptible cells, was recovered from the tissue culture. The investigative tool thus contrived promises to have wide application in viral studies in general. In collaboration with Miss Grace Leidy and Mrs. Eros Hahn, Dr. Alexander studied the susceptibility of *Hemophilus* organisms to change in their genetic characteristics through contact with a specific desoxyribonucleic acid. Using this test as a criterion of interrelationship among different species of *Hemophilus*, these workers were able to demonstrate a close similarity in genetic structure between *H. influenzae* and *H. aegyptius*, strongly suggesting that the latter, earlier described as a distinct species, may well be a deviant strain of the former.

Dr. Katherine Sprunt undertook a careful study of the bacterial flora cultivable from the nose and throat of infants on the newborn service of Sloane Hospital for Women, as well as from their mothers and from the nurses and doctors caring for them, in order to learn whether a close correlation could be demonstrated between the recovery of certain so-called epidemic strains of *Staphylococcus aureus* in cultures and the frequency or severity of clinical staphylococcal infections in the same population. Her observations, which were extended over many months, led to the conclusion that so-called epidemic strains of staphylococcus tend to appear and to disappear spontaneously in the nasopharyngeal flora of patients and contacts with little temporal relationship to outbreaks of clinical disease. These findings stand in sharp contrast with the hypothesis which currently determines policy in

a number of services for newborn infants, namely, that when any of the so-called epidemic strains of staphylococcus is recovered from a person who resides in or has ready access to the infant nursery the probability of a significant outbreak of transmissible infection is great and prudence dictates the closure of that particular patient area for an indefinite interval. Comparative freedom from significant Staphylococcal infections in the nurseries of Sloane Hospital, as contrasted with the experience of a number of other newborn services in medical centers throughout the country, affords no grounds for complacency but rather calls for more intensive investigation of the whole problem of cross-infections.

Dr. Saul Blatman and Professor Douglas S. Damrosch, following up a lead obtained in the course of a cooperative study of the results of antibiotic treatment of the initial infection in tuberculosis, made the unexpected discovery that significant numbers of infected children continue to harbor viable tubercle bacilli in the lumen of their tracheobronchial tree, irrespective of whether they have been advised to continue drug treatment or to do without it.

The circumstances under which an infant about to be born may acquire infection through contact with infected amniotic fluid *in utero* have been investigated by Professor William A. Blanc, who has for some years been studying the correlations between evidences of infection in the fetal membranes, placenta and umbilical cord and manifestations of infection in the infant after birth. The seriousness of this source of perinatal morbidity appears not to have been fully appreciated in the past. In the course of his studies, Dr. Blanc has introduced a number of technical procedures for evaluating so-called amniotic infection.

Professor Dorothy H. Andersen and Dr. Eugene V. Perrin, Instructor in Pathology, analyzed the experience of the pediatric pathology laboratory in so-called "soft tissue tumors," many of which arise from collections of embryonal cells which make themselves known during childhood by their eventual multiplication and growth. Both benign and malignant forms are known, and the indications for surgical intervention are under continuing study.

The research program in cystic fibrosis of the

pancreas continues to explore various lines of approach. From the clinical standpoint, with the improved life expectancy which results from earlier recognition and improving methods of treatment, the average age of patients under continuing observation is slowly increasing. Professor Dorothy H. Andersen and Professor Paul A. di Sant'Agnese have had the collaboration of Dr. Herbert I. Cohen and Dr. Carolyn R. Denning and others in long-term clinical observations from which the picture of the disease as it is manifested in adolescents and young adults is beginning to become more clearly defined. New agents of treatment of the pulmonary infection from which most fibrocystic patients suffer are being constantly evaluated. A significant anatomical peculiarity, the relative freedom of these patients from atherosclerotic changes in the large arteries, has been established by Professor Andersen and Professor Blanc in association with Dr. Russell L. Holman of the Louisiana State University School of Medicine. More precise chemical characterization of the mucoprotein fractions, and in particular of the mucoids, obtained from duodenal fluid of patients with cystic fibrosis has been made possible through a joint project in which Professor di Sant'Agnese has enjoyed the close cooperation of Dr. Zacharias Dische, Professor of Biochemistry, Dr. Charles Pallavicini, Research Associate in Biochemistry and Mr. Joshua Youlus.

New information has been obtained by Dr. di Sant'Agnese on the peculiar composition of the sweat of cystic fibrosis patients and on their inability to conserve sodium chloride under various conditions of imposed stress. Encouraging progress has been made in studies of the genetics of the disease and in the identification of the symptom-free heterozygous carrier of the genetic trait. Dr. Louis Gluck, while an Assistant Resident on the Pediatric Service, enlisted the cooperation of chemists of the Eastman Kodak Company of Rochester, New York, in perfecting a patch test for measuring the concentration of chloride in sweat which promises to find wide use as a screening device for identifying individuals who have the constitutional background of the disease but who may not yet have experienced its overt manifestations.

During Professor Ruth C. Harris's leave in

1958 and the first part of 1959, she remained in close touch by correspondence with the biochemical studies going on in our pediatric laboratories. At the same time, her group of patients had been kept under continuing observation by Dr. Robert B. Mellins in the Liver Disease Clinic of Vanderbilt Clinic; so that on her return she was able to resume her investigative program without delay. The work takes two general lines: refinement of definition of the biochemical changes associated with various diseases which involve the liver, and exploration of the changes in liver function which result from growth, maturation and exposure of the child to a variety of stresses. New light has been thrown on the group of metabolic disturbances known as glycogen storage disease, some forms of which are determined by inadequacy of specific and well identified hepatic enzymes, while others involve more conspicuously the heart and skeletal muscles and depend on more obscure biochemical abnormalities, the nature of which is under study. With the collaboration of Dr. Garrison Rapmund she has extended the series of investigations into the pathogenesis of kernicterus in premature infants which had been begun some years previously. Additional progress has also been made in the non-operative differentiation of causes of obstructive jaundice in the early months of life.

Professor Melvin M. Grumbach has had the cooperation of Dr. Jacques R. Ducharme, Dr. Jean Fris-Larrouy, Dr. Selna Kaplan, and Dr. Akira Morishima in studies of pediatric endocrinology. In addition to their on-going long-term studies of the distribution and metabolism of hormones as a function of age and development, they have undertaken the evaluation of a number of new pharmaceutical agents made available as hormonal replacement or substitution. Progress has been made in the development of a technique of quantitative analysis of human pituitary growth hormone in the minute amounts ordinarily present in the blood. In the pursuit of determinants of sex differentiation, only part of which is hormonally controlled, Dr. Morishima has worked out the complex technique of chromosome counting and matching and has confirmed observations originally made in other clinics establishing abnormal chromosome numbers in patients with certain developmental anomalies of

the sex organs as well as in patients with mongoloid idiocy.

Professor James A. Wolff has maintained an active research program in pediatric hematology with the collaboration of Dr. Anneliese L. Sitarz and Dr. Memee H. King. In a study of the effect of parenterally injected iron in prevention of the late phase of the anemia of prematurity, the superior reliability of this form of treatment over the more conventional prescription of an iron preparation for oral administration in the home was firmly established. Long-term results of splenectomy in the treatment of Mediterranean anemia were analyzed. Other investigations dealt with the frequency and magnitude of fetal blood loss into the maternal circulation during pregnancy and with its possible effect on the course and outcome of pregnancy. The group at Babies Hospital continues to collaborate with other pediatric centers throughout the country in co-operative assessment of various agents developed for the treatment of acute leukemia.

The Premature Infant Unit in Babies Hospital provides a favorable opportunity for continuing inquiry into the optimal conditions of the physical environment for such patients. Professor William A. Silverman has enlisted the cooperation of Dr. Frederick J. Agate, Associate Professor of Anatomy, in devising methods of controlling the relative humidity of the atmosphere inside an incubator. Another study is concerned with the advantages of early feeding or early fasting of premature infants. Late consequences of neonatal bilirubinemia are being investigated by a systematic follow-up of children who had been under observation in the premature nursery in their immediate postnatal period and who now at the age of three years are being scrutinized for neurologic or psychologic residua. A follow-up study at age two years of infants who during their stay in the premature unit had been treated with a sulfonamide preparation showed no increase in the frequency of neurologic handicaps as compared with controls, despite the fact that, in the earlier phase of the study, a higher incidence of brain damage had been demonstrated in the treated group. Professor William A. Bauman analyzed the experiences of a group of premature infants who showed signs of postnatal respiratory distress; from this study has emerged a clearer

definition of the relative import of the various signs and circumstances which go to make up the respiratory distress syndrome.

Professor L. Stanley James has had the assistance of Dr. Eric Burnard in his studies of the adjustment of the newborn infant to the change from intrauterine to extrauterine life. Increasing attention is being focused on the performance of the newborn infant's heart as a measure of his success in achieving recovery from the asphyxia associated with the birth process, and new methods of evaluation of cardiac function have been devised and applied.

In the Fetal Life Study, under the direction of Professor Gilbert W. Mellin, admission of new mothers to the study group was terminated in April, 1959, at which time the total number of pregnancies included for analysis exceeded 10,000. The last neonatal examination of infants born to mothers comprising the study population was completed in November and there now remains only the final evaluation of these infants at age one year before the completed data on congenital malformations can be prepared for analysis. Although it is not to be expected that the incidence and distribution of malformations based on analysis of the entire study population will differ greatly from those already derived from the earlier analysis based on 5,694 pregnancies, their validity will be considerably enhanced because of the larger number of infants included in this later phase of the overall study.

The Department of Pediatrics in the University joined with the Departments of Anesthesiology, Neurology and Obstetrics and Gynecology in a cooperative study designed to elucidate the causes of cerebral palsy and mental retardation. This is an investigative venture of unprecedented scale initiated by the National Institute of Neurological Diseases and Blindness and participated in by a dozen or more university clinics throughout the country. In the first stages of its organization at the Columbia-Presbyterian Medical Center Dr. D. Anthony D'Esopo, Professor of Clinical Obstetrics and Gynecology and Attending Obstetrician and Gynecologist was project director and Dr. Gilbert W. Mellin, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, was put in charge of pediatric aspects of the study. More recently, Dr. Marguerite J.

Gates, Assistant in Pediatrics and Assistant Pediatrician, has been named project director and has, in addition, assumed immediate responsibility for pediatric examinations and follow-up. The plan of investigation, not having been clearly formulated in its early stages, has been in a continual state of flux, with the result that the project has assumed larger proportions and been more demanding in its space requirements than could have been anticipated at the start. Gains that may eventually be derived from the study justify the great efforts which have gone toward assurance of its success.

In closing this brief account of research activities in the Department of Pediatrics, it is a pleasure to express the gratitude which all of the participants feel for the gifts and grants which have made this program possible. Among the benefactors, special thanks are due to the American Cancer Society, the Association for the Aid of Crippled Children, the Dunlevy Milbank Foundation, the Kidney Disease Foundation of New York, the Lillia B. Hyde Foundation, the Loyal League Philanthropies, Mr. DeWitt J. Manheimer, Mead Johnson & Co., the National Foundation, the National Institutes of Health of the United States Public Health Service, the New York Heart Association, the Nutrition Foundation, the United Fruit Company and Mr. Sidney J. Weinberg. Without their support little if any of this research accomplishment could have been realized. Thanks are due also to Mead Johnson & Co. for a gift in support of the residency training program, which enabled some of the resident staff to attend meetings of national pediatric societies.

International Pediatric Congress

The choice of Montreal for the site of the Ninth International Congress of Pediatrics in July, 1959, brought a flood of visitors to the hospital which began in May and lasted well into September. Many of the more distinguished among these guests addressed the staff on a topic of their own research. The list is long and cannot be trimmed without risking invidious discriminations. As many of our own staff as could be spared attended the congress and it is a pleasure to report that among our own contributions twenty-one papers were included in the program, ten

staff members served as chairmen of panels or of other sessions, and three took part in panels devoted to specific areas of research. Dr. McIntosh had the privilege of representing the United States delegation as their voting member in the business meeting at which initial preparations were made for the next meeting to be held in Lisbon in 1962.

I cannot close without paying tribute to the spirit of loyalty and wholehearted cooperation which has animated the pediatric service through-

out the years during which I have had the privilege of being its director. Not only the professional staff, but the entire nonprofessional complement as well have maintained a united front in moving ahead in our constant efforts to improve the quality of patient care, to contribute to the corpus of pediatric knowledge, and to teach effectively. Whatever has been accomplished has been made possible through their participation and because of their support.

Pharmacology

HARRY B. VAN DYKE, *David Hosack Professor and Chairman of the Department*

In previous years, the teaching of pharmacology in the second year has been difficult owing to the extremely heavy schedule of courses in the third trimester. The curriculum for the whole of the second year has been altered and now permits the course in pharmacology to be given in the first and second trimesters. During the intensive teaching in the second trimester, the other principal course is in pathology. The new arrangement also provides greater flexibility in laboratory schedules. The teaching area for demonstrations has been greatly improved by the removal of little-used and obsolete laboratory benches to permit enlargement and the installation of modern fluorescent lamps. Closed circuit television with dual cameras and large receivers is now in use for the third year. New recording equipment has been added so that an increased number of events can be demonstrated simultaneously. The majority of the student experiments are now demonstrations of pharmacodynamics or other actions of drugs. Through the cooperation of the Department of Physiology, additional experiments by small groups of students are performed in the large laboratory on the third floor. When expansion of space becomes possible after the erection of the projected new research building, it is planned to assign individual small rooms to student groups for experiments with modern electronic recording equipment and for conferences.

During the period under consideration, there have been no noteworthy changes in the teaching staff. Members of other departments have made important contributions to the teaching program by giving lectures or participating in experiments. The principles of modern anesthesia were demonstrated by Dr. Emanuel M. Papper, Professor of Anesthesiology and Director of the Anesthesiology Service. Lectures were given by Dr. Sidney Carter, Associate Professor of Neurology and Attending Neurologist, Dr. Alfred Gellhorn, Professor of Medicine (Delafield) and Associate Attending Physician, Dr. Leonard J. Goldwater, Professor of Occupational Medicine, Dr. John

V. Taggart, Professor of Medicine and Associate Attending Physician, and Dr. John E. Ultmann, Instructor in Medicine and Assistant Physician. A new demonstration of behavioral pharmacology was introduced by Dr. Jurg A. Schneider; this technique is now widely used in the study of tranquilizing drugs. The course in applied pharmacology is offered to the third and fourth year students in cooperation with the Department of Medicine; Professor Frederick G. Hofmann represented the Department of Pharmacology and Professor Hamilton Southworth represented the Department of Medicine in organizing this course.

Dr. J. H. Gaddum, Director of the Institute of Animal Physiology near Cambridge, England, was Squibb Lecturer in the department. He gave two lectures one of which was for the second-year class. Lectures by Dr. B. A. Cross of Cambridge University and Dr. G. V. R. Born of the University of Oxford were given before student-faculty audiences. Other distinguished lecturers were Professor U. S. von Euler of the Physiological Institute of the Karolinska Institutet in Stockholm and Professor R. Caldeyro-Barcia of the University of Montevideo. The lecture by Professor Caldeyro-Barcia was given under the joint sponsorship of the Departments of Obstetrics and Gynecology and of Pharmacology.

Many visitors discussed research and teaching programs with the staff. Among those who should be mentioned, in addition to lecturers, are Professor S. V. Anichkov of Leningrad, Professor U. P. Bijlsma of Utrecht, Professor G. A. H. Buttle of London, Dr. Alastair Currie of Glasgow, Dr. S. J. Folley of Reading, England; Professor T. Holtz of Frankfurt, Professor A. C. Liu of Taipei, Professor M. Rocha y Silva of Sao Paulo, Dr. Ernst Rothlin of Basel, Professor V. S. Rusinov of Moscow, Professor Z. Szreniawski of Warsaw and Professor V. Zakusov of Moscow.

The department fosters graduate training in pharmacology but has been hampered by a shortage of suitably qualified candidates. In order to acquaint prospective graduate students, now

completing their undergraduate course in neighboring universities with the field of pharmacology and the opportunities for training in the department, Professor F. G. Hofmann has met with undergraduate students and lectured in Amherst, Cornell, Rutgers, Trinity, Wesleyan and Williams Universities. The department was also able to offer to two interested and highly recommended students, who had completed their junior year, summer assistantships which increased their acquaintanceship with research in pharmacology. The future program of graduate training will be greatly facilitated by a grant from the National Institutes of Health for the training of graduate and postgraduate students. A postgraduate training grant, restricted to the field of neuropharmacology, was also received from the National Institutes of Health. This program is under the direction of Professor Shih-Chun Wang.

Undergraduate medical students interested in research have been welcomed in the department for work in various fields. Mr. LeRoy L. Costantin and Mr. Jay Robbins worked in association with Professor Wang. Mr. Costantin completed a paper, "Effect of Pulmonary Congestion on the Vagal Afferent Activity," which appeared in the *American Journal of Physiology*. Mr. Robbins prepared a manuscript, "The Excitation and Inhibition of Crustacean Muscle by Amino-Acids," which was published in the *Journal of Physiology*. Mr. William Dantzler undertook an investigation of the renal response to neurohypophyseal hormones under the direction of Professor Wilbur H. Sawyer. Mr. John S. Robinson was associated with Professor Hofmann in one aspect of a study of *in vitro* steroidogenesis.

In the fall of 1958, Professor Wang was appointed Visiting Professor in the National Taiwan University Medical School and the National Defense Medical Center, Taiwan (Formosa), under the sponsorship of the China Medical Board of New York. Professor Wang initiated two research projects while there. One was on the mechanism of emetic action of DBI, a new oral hypoglycemic agent, chemically identified as N^1 - β -phenethylformamidinyliminourae HCl. It was found that this agent produces emesis independent of its hypoglycemic effect. The site of emetic action is located in the *area postrema*. The other project was carried out in collaboration with Dr.

H. S. Fang, Professor of Physiology in the National Taiwan University. The purpose of the study was to identify the reactive points in the hypothalamus which liberate antidiuretic hormone from the posterior lobe of the hypophysis.

In collaboration with Dr. R. Bircher of Sandoz Pharmaceuticals, Professor Wang studied the site of action of several convulsants and anti-convulsants by injecting these drugs into various cerebral ventricles. Dr. Hsueh-Hwa Wang, Dr. Marvin R. Blumenthal of the Department of Medicine and Professor Wang investigated the vagal effect on the coronary blood flow. It was found that the vagus influences primarily the cardiac contractility and only indirectly affects the coronary blood flow. Dr. Ronald L. Katz of the Anesthesiology Staff, Professor Shih-hsun Ngai and Professor Wang continued their investigation of the central control of respiration. Under an Air Force Contract, Professor Wang investigated the emetic response in monkeys exposed to simulated high altitudes and found that hypoxia, or some metabolic products as a result of hypoxia, stimulated the chemoceptive trigger mechanism for emesis.

Professor H. B. van Dyke, Dr. A. R. Currie of Glasgow and Mrs. Hannelore Adamsons estimated the quantities of neurohypophysial hormones in a group of human pituitary glands. The quantities found could not be correlated with disease.

The pharmacological characteristics of the neurohypophysial hormones of different vertebrates were determined by Professors Sawyer and van Dyke and Robert Munsick, a Josiah Macy Jr. Foundation Fellow in the Department of Obstetrics and Gynecology, working in our department. The hormones present in the chicken, frog, toad, marine teleost and marine lamprey were studied by using the multiple assay technique. The active principles in these extracts resemble oxytocin and the artificial analogue, arginine vasotocin. The pharmacological characterization of these extracts constitutes presumptive evidence that vasotocin is a natural hormone in many non-mammalian vertebrates. Professor V. du Vigneaud of Cornell University Medical College kindly furnished pure hormones and analogues for this study.

As part of the study of the neurohypophysial hormones, Professor Sawyer adapted the isolated

bullfrog and toad bladder preparation for purposes of assaying neurohypophysial principles. He has also done preliminary studies on the neurohypophysial hormones of elasmobranchs in collaboration with Dr. J. M. Dodd of the University of St. Andrews (Scotland). Elasmobranchs do not appear to have a vasotocin or vasopressin-like hormone but do possess activities indicating the presence of a peptide resembling oxytocin. Professor Sawyer continued his earlier studies on the action of neurohypophysial hormones on the isolated bullfrog bladder and the relationship between ion and water transports across this membrane. Dr. Julia V. Uranga of Buenos Aires, working in association with Professor Sawyer, completed an investigation of the action of arginine vasotocin and frog neurohypophysial hormones on diuresis and renal function in the bullfrog. Mr. Wah-yip Chan, doing graduate research under Professor Sawyer's direction, studied the action of neurohypophysial hormones on renal function in dogs and chickens.

Professor Herbert J. Bartelstone reported studies of the role of the veins in venous return as well as other aspects of the physiology of the veins. A method was developed for studying the responses of the venous system while it is isolated from the effects of cardiac ejection, cardiac attraction and the pumping action of muscle or of the respiratory system. He concluded that continuous alteration in venous tone is one of the factors contributing to the return of blood to the heart. Veins also play an active part in certain cardiovascular reflexes. The effects of vasoactive drugs on the venous system were also studied.

Dr. H. C. Kwaan of Hong Kong, a Fellow of the China Medical Board of New York working in collaboration with Professor Bartelstone, demonstrated that corticotropin is released from the anterior pituitary after the instillation of minute doses of arginine vasopressin into the third ventricle of conscious dogs. Thus it appears that this vasopressin can act as a "corticotropin-releasing factor." Oxytocin and some other analogues of vasopressin did not have this effect.

Professor Hofmann continued his studies of the *in vitro* synthesis of cortical steroids by the adrenals of various animals. He demonstrated that a mitochondria-free guinea pig adrenal

homogenate is capable of hydroxylating certain steroids at carbon 17 and showed that it is a TPNH-dependent reaction. Other work on adrenal tumors in mice was carried out by Professor Hofmann in collaboration with Dr. Nicholas P. Christy of the Department of Medicine and Dr. M. M. Dickie of the Jackson Memorial Laboratory in Bar Harbor, Maine. Cell-free homogenates of these tumors possess a subnormal capacity for hydroxylating progesterone at carbons 11 and 21. Neither morphological nor chemical data suggest that the adrenocortical secretions of these tumors are abnormally enhanced.

Dr. Munsick investigated the effect of the magnesium ion on the response of the isolated rat's uterus to neurohypophysial hormones and various analogues which had been synthesized by Professor V. du Vigneaud and his collaborators in Cornell University. Dr. Munsick also completed a study of the excretion of 5-hydroxyindoleacetic acid, a metabolite of serotonin, in women with severe symptoms of the menopause; no increased excretion of the metabolite occurred.

At the XXI International Congress of Physiological Sciences, held in Buenos Aires in August, 1959, scientific papers were read by Professors Hofmann, Sawyer, van Dyke and Wang. They also visited a number of university medical schools in South America. Professor van Dyke addressed scientific symposia sponsored by universities in Santiago, Chile and Sao Paulo, Brazil. Professor Sawyer and he participated in a Symposium on Oxytocin in Montevideo, Uruguay.

Liberal support of the activities of the department has been given by governmental agencies, foundations and pharmaceutical firms. The National Institutes of Health not only have furnished two grants for graduate or postgraduate training but also have supported the research projects of various members of the staff. Grants for research, teaching equipment or the support of trainees have also been received from the School of Aviation Medicine of the United States Air Force, the American Heart Association, the New York Heart Association, the Lilla Babbitt Hyde Foundation, Abbott Laboratories, Hoffman-La Roche Company, Eli Lilly and Company, Charles Pfizer and Company, Sandoz Pharmaceuticals and E. R. Squibb and Sons.

Physical Medicine and Rehabilitation

ROBERT C. DARLING, *Professor and Chairman of the Department
Director of Service*

The period of this report has seen considerable progress in the long-term plans for a more fully rounded hospital and teaching program in this specialty. The most significant single development was the procurement of funds which enabled the Medical Center to make plans for an inpatient service in rehabilitation. Under these plans, the eighth floor of Neurological Institute will be enlarged and will house sixteen beds in four 4-bed units. The modernized physical medicine treatment area on this floor will also serve patients from the other floors of the Neurological Institute. It is anticipated that the construction of this unit will be completed in 1960. The funds for this construction and refurnishing have been made available through two most generous anonymous donors.

Another significant step in the development of physical medicine and rehabilitation as a teaching and demonstration service was made possible by a teaching grant award from the Office of Vocational Rehabilitation of the United States Department of Health, Education, and Welfare, which allows support of teaching activities in addition to stipends for trainees. Professor Shyh-Jong Yue is coordinator of teaching activities under the program, and a social worker and vocational counselor are being supported to supplement existing regular personnel. Mrs. Charlotte M. Rhodes has been appointed as an Assistant in the department to function as a vocational counselor, working in close liaison with the Department of Psychology. Several months' experience has demonstrated rather dramatically the possible contributions of such a person within the framework and policies of a general hospital. It is apparent that evaluation and planning during early convalescence in the hospital is of great value not only to the patient but also as a demonstration to residents, fellows and students, that evaluation

and planning are pertinent considerations.

Residents and fellows in the department currently number five. This number has allowed coverage of clinical duties and a highly planned educational program. All residents and fellows participate in the two-month period of basic science training organized and developed by the Department of Orthopedic Surgery. Vanderbilt Clinic experience for the residents is now organized in a team consisting of an attending physician with one or more residents or fellows working under his supervision. Regular clinical evaluation, bed-side rounds, and journal club meetings further supplement the educational program.

Dr. John A. Downey finished residency training and an additional year as a Research Associate, and is currently spending a further year of clinical training in internal medicine in Boston. In the course of his research, working with Professor Robert C. Darling, he completed studies of the effects of salicylates on exercise performance and on the temperature response to exercise. The modifications of exercise performance brought about by salicylates were found to be theoretically of interest but minor from a practical point of view.

Upon the death of Dr. Robert Muller, director of physical medicine at St. Luke's Hospital, Professor William B. Snow, as consultant, and Dr. Yue as acting director, undertook during a portion of their time to maintain and develop the program in physical medicine at St. Luke's. It is anticipated that with further strengthening, this program will affiliate more closely with the Medical Center.

Dr. Snow received a distinguished alumni award from New York State College of Medicine, Downstate Branch. He has continued his active collaboration with handicapped children's

programs of the New York City Board of Education, and other community projects.

Dr. Darling is president-elect of the New York Society of Physical Medicine and Rehabilitation; Chairman of the United Hospital Fund Advisory Committee on Occupational Therapy and a member of the Executive and Research Committees of the New York Tuberculosis and Health Association. He is currently chairman of the University Seminar on the Role of the Health Professions.

Professor Morton Hoberman is a member of the Board of Governors of the American Academy of Physical Medicine and Rehabilitation and serves on a subcommittee on rehabilitation problems of the Committee on Public Health of the New York Academy of Medicine.

The Postgraduate Course in Cerebral Palsy has been presented annually for the last two years. Enrollees in the course continue to represent a wide geographical area and from them has emerged a highly competent enthusiastic group. The continuation of the course will depend upon a survey of the demand for such a course. Over the years, it has given special orientation training in the specialized problems of cerebral palsy to a total of 172 professional workers: thirty-two physicians; sixty-six physical therapists; sixty-eight occupational therapists; five speech workers; and one nurse. It is possible that regular medical and therapy education will be meeting this need in the future.

During the year (1959), 50,001 patient visits were made to the department and a total of 82,332 treatments given. Of this latter total, 6,913 were occupational therapy and 75,419 were physical therapy. Fifty per cent of the treatments were to clinic patients, twenty-five per cent to private patients, sixteen per cent to ward and nine per cent to semi-private patients.

Occupational Therapy Training Courses

The number of students enrolling for these courses continues to be less than the complement allowed: twenty-seven in the academic program in 1958-59; twenty-five in 1959-60. However, partly through recruitment services of Mrs. Adeline Deutsch, Instructor in Occupational Therapy, the recruitment outlook is improving slightly. If arrangements can be made for continuing a re-

cruitment member on the staff, there are clear indications that enrollment can be improved. Among Mrs. Deutsch's recruitment activities have been the presentation of the occupational therapy program to students at more than thirty nearby colleges, and the arrangement for summer experience in the field for college students on an organized basis. Over sixty per cent of the students have been able to obtain scholarship assistance, mainly through the aid of a traineeship grant from the Office of Vocational Rehabilitation, but also from several foundations.

Professor Marie L. Franciscus spent the academic year 1958-59 as a Fulbright Research Scholar in the United Kingdom on sabbatical leave from Columbia University, working principally at the Liverpool School of Occupational Therapy. She made observations and analysis of occupational therapy education in the United Kingdom. With the aid of Miss Eleanor C. Kille, instructor in occupational therapy, for half of her absence period and reallocation of duties, the staff was able to carry on in her absence.

The teaching portion of the grant for occupational therapy from the Office of Vocational Rehabilitation was discontinued for the year 1959-60. It was therefore necessary that the enlarged courses of occupational analysis and prevocational evaluation, and activities of daily living, which were sponsored under this grant, be carried as a regular part of the program since they had proved their definite value and essentiality.

The Joint Occupational Therapy Student Affiliation Council, an organization designed to coordinate the clinical affiliation activities of occupational therapy in Columbia University, New York University, the University of Pennsylvania, and Richmond Professional Institute, is now quite definitely organized and meets yearly to discuss problems which are basically common to the four schools.

Compared nationally with other schools of occupational therapy, the graduates of the school have ranked in the last two years, fifth and third respectively; throughout the history of these courses, graduates regularly have been within the first five places.

In the final year of the OVR teaching grant, two instructional manuals were published and distributed to teaching centers: one, a Manual of

Decorative Textile Techniques by Miss Edith Brokaw; the other, a Manual for Occupational Therapists on Prevocational Exploration by Dr. Jack Granofsky. Also, a recruitment program brochure entitled "What is Occupational Therapy?" was prepared and printed in cooperation with the Center of Mass Communications of Columbia University and was widely distributed.

Miss Geraldine Shevlin completed a two-year fellowship under the support of the National Foundation in a combined program at Teachers College and in the occupational therapy training program.

The allocation of two additional rooms jointly to occupational therapy and physical therapy has made it possible to have satisfactory locker space for the students and desk space for graduate fellows and instructors.

Miss Elizabeth A. Scully, Chief of Occupational Therapy in the Hospital, Instructor in the College, resigned. Miss Dorothy Mautner has been appointed to the Hospital position and a more active collaborative program is being developed.

In view of the continued marked national shortage of occupational therapists and the opportunities which this field affords, there is urgent need for active recruitment and readily available subsidy for the students. This becomes necessary as the tuition costs at private universities increase.

Physical Therapy Training Courses

Students enrolled in the academic program in physical therapy numbered 47 in 1958-59; 40 in 1959-60. This number is appreciably below the allowable enrollment of 50. It is notable that of the total number of students originally accepted for the program, one-quarter withdrew for financial reasons. Scholarship assistance, largely from the National Foundation, has been procured by

over half of the students, but in most instances, the decision on scholarship aid from these agencies was not available at the time the students were required to make a decision on a school. It is notable that the recruitment efforts of Mrs. Deutsch, officially designated as relating to occupational therapy, has had its influence on the recruitment for physical therapy. Arrangements to continue this service would affect both fields.

Miss Anne Rumpler, currently a Fellow supported by the National Foundation, is preparing for teaching and administrative work in a school of physical therapy, with a joint program at Teachers College and in the physical therapy training courses.

The advanced course in kinesiology under Miss Signe Brunnstrom has been offered to senior students; another section of this course is being planned to be offered to graduate therapists in the New York area.

Miss Mary Cover, chief physical therapist in the Hospital and instructor in physical therapy in the College, resigned due to ill health. Mr. Samuel Feitelberg, newly appointed Chief Physical Therapist in the Hospital and Instructor in the College, has assumed a greater role in the development of a strong clinical training program in the Hospital treatment facilities.

The degree program for physical therapists was reviewed and reregistered with the New York State Education Department for a three-year period.

As in occupational therapy, but only slightly less acute, the need for recruitment and for financial subsidy of students is most urgent, especially in view of the much greater costs of physical therapy education in private universities as compared with state or other government institutions. The national and local shortage of trained physical therapists to meet the needs of patients is still great.

Physiology-1959

MAGNUS I. GREGERSEN, *Dalton Professor and Chairman of the Department*

In 1959, the department was strengthened by new appointments and by the arrival of a visiting professor and several research fellows. Dr. Shunichi Usami from Dr. Yoshimura's Laboratory at Kyoto Prefectural University of Medicine and also Assistant Professor of Physiology at the Miye Prefectural University of Medicine in Tsu, Japan, joined the department as Instructor for a two year period; Dr. Elizabeth Carlsen Gerst, well-known for her investigations on respiration with Dr. Comroe at the University of Pennsylvania Medical School, and, subsequently, Instructor in Physiology at Cornell University Medical School, was appointed Instructor in July; Dr. Martin Blank, who over the past two years has been working in the Department of Colloid Science, Cambridge University, England, as a postdoctoral Fellow of the National Institutes of Health, was appointed Instructor in September; Dr. Masayasu Sato, Professor of Physiology at Kumamoto Medical School, Japan, is spending his sabbatical year (1959-60) in this department as Visiting Professor; Dr. Nobusada Ishiko, Visiting Fellow, also from Kumamoto Medical School, has been working in the department since September, 1958; Dr. Deogracias Rodil, Assistant Professor of Physiology at the Far Eastern University Institute of Medicine in Manila, Philippines, is a visiting Research Fellow under the International Cooperation Administration; and Mr. George Cooper, currently completing his work for the Ph.D. degree in physiology at New York University, was appointed predoctoral Fellow in September and will shortly become a postdoctoral Fellow under the United States Public Health Service Training Program.

Dr. Werner R. Locwenstein was advanced from Assistant Professor to Associate Professor in September. Dr. Mero Nocenti was advanced from Instructor to Assistant Professor on July 1st. Dr. Gerd. Muelheims, Instructor in Physiology and Research Fellow of the United States Public Health Services, who was advanced to Assistant Professor on July 1st, resigned in August.

Dr. G. Richard Rowley, Instructor, resigned December 15, 1959, to accept a position in the Research Department of the Colgate Palmolive Company. Dr. Ruth Rawson, Instructor, resigned in August, 1958, to accept a position in the Department of Physiology at the University of Texas Southwestern Medical School in Dallas, Texas, where her husband, Dr. Morris Ziff, is Professor of Medicine and Chairman of the Department. Dr. Leonard Levine, Instructor who received the Ph.D. degree last spring, is currently a postdoctoral Fellow, United States Public Health Service.

Professors Magnus I. Gregersen, and William L. Nastuk have obtained for the department a five year training grant from the United States Public Health Service which will support the graduate training program leading to the Ph.D. degree in physiology. Provision for postdoctoral training is also included. Professor Nastuk is recruiting students under this grant and directing the procurement of scientific equipment required for the training program.

The success of the pilot teaching unit embodying modern electronic methods, set up in 1957-58, for one fourth of the medical class, has justified the extension of these facilities. Funds have been obtained with which the entire student laboratory is being modernized under the direction of Dr. William Walcott, Associate Professor, and Professor Nastuk. Thus, the whole medical class will be able to utilize electronic recording in their laboratory exercises. Dr. Walter S. Root, Professor, reorganized and directed the Dental Course in Physiology in 1958-59. During the present academic year, this course is under the direction of Professor Locwenstein. Professor Walcott was in charge of the administration of the Medical Courses in 1958-59, and during the present year this course is being administered by Dr. Shu Chien, Assistant Professor. Professors Root, Nastuk, Locwenstein, Chien and Dr. Levine participated in the instruction given in the new inter-departmental course on the structure and function of the nervous system. The courses for

students in physical and occupational therapy are being given by Professor Chien and Mrs. Patricia Farnsworth and various members of the staff, including Professors Root, Nastuk, Walcott, Cizek; Dr. Gerst lectured in the course for nurses.

Professor Louis J. Cizek, Associate Professor, served as departmental representative for the Summer Session. There has been a steady increase in the demand for admission to the summer course in medical physiology, as well as a noticeable improvement in the quality of applicants, the majority of whom come from leading American graduate schools, including Columbia University. Recent changes in the first year medical curriculum make it impossible for a number of graduate students registered under Columbia's Faculty of Pure Science to adjust their schedules to include the course in physiology with the medical class. For these students, the summer course in medical physiology provides a welcome alternative and amply justifies the effort which has been made for several years to set up the highest standards of graduate instruction for this course.

The work which Professor Root started in 1957-58 with Mr. Edward Herzig, Public Health Post-sophomore Dental Research Fellow, on the relation of the sympathetic nervous system to the circulation of bone marrow has been extended by Mr. Ronald Weiss, predoctoral Fellow, who is investigating the innervation of bones. In collaboration with Professor Root, Dr. Rodil is investigating the degree of hypoxia necessary to evoke secretion of the adrenal medulla. Dr. Y. D. Al-Naaman of the Department of Surgery, who is working in this Department to complete requirements for the Doctor of Medical Science degree, is collaborating on this problem. Dr. Gerst is investigating the site of production of hemopoietin, and Mr. George Cooper is studying the effect of hypoxia as a factor in the possible release of hemopoietin by the kidney.

Professor Loewenstein and his collaborators are continuing their work on the mechanisms of nerve impulse initiation at receptor organs. Using the Pacinian corpuscle, they have localized for the first time the site of origin of electrical activity in a sense organ. The graded generator potential is found to arise at the non-myelinated nerve ending and the all-or-nothing nerve impulse at the adjacent first Ranvier node inside the

sense organ. It seems likely that other sense organs, innervated by myelinated nerve fibers, follow the same pattern of impulse initiation. An interesting finding is that the receptor membrane of the non-myelinated ending contains functionally independent receptor sites, each being a self-contained receptor unit. The generator potential appears to be the aggregate result of the electric activity of such receptor sites. Dr. Ishiko and Professor Loewenstein find evidence for the statistical nature of the excitation process of the receptor sites, while Dr. Sidney J. Socolar, Research Associate, has worked out the kinetics of the statistical excitation. Dr. Sato and Dr. Socolar are studying the kinetics of the desensitization processes in the receptor membrane of Pacinian corpuscles.

Professor Loewenstein reported these findings at the Plenary Symposium of the Annual Biophysical Society meeting and at the Second Conference of Physicochemical Mechanisms of Nerve Activity at the New York Academy of Sciences. During the past summer, he lectured at the University of Brazil, at the University of Chile, and before the Physiological Society of Chile. He also took part in the International Symposium of Comparative Bioelectrogenesis at Rio de Janeiro, and the International Congress of Physiology, Buenos Aires.

Dr. Martin Blank is continuing his basic research on the properties of monolayers and is giving an intensive series of seminars on physical chemistry for members of the staff and graduate students. Dr. Usami is attempting to simplify and improve the methods for assay of aldosterone and is also working with Professors Gregersen, Cizek and Chien on separation of the vasomotor and endocrine factors in the renal response to pressure breathing, allegedly caused by stimulation of "volume receptors."

Professor Nocenti has continued to study the effects of altered thyroid function and estrogens on ovarian physiology. In collaboration with Dr. Clement A. Furey, Jr., Assistant in Urology and Assistant Urologist in Vanderbilt Clinic, he is investigating the effect of adrenal corticoids and other agents on experimentally induced connective tissue plaques. Dr. Nocenti is writing the endocrine section for the new edition of Bard's *Medical Physiology*.

Professors Gregersen, Cizek and Chien are collaborating with Dr. Charles Pallavicini, Research Associate in Biochemistry, and Dr. Zacharias Dische, Professor of Biochemistry, on the study of salivary gland secretion during salt deficiency which may elucidate certain aspects of cystic fibrosis.

Professor Nastuk continues his studies of transmission at the neuromuscular junction. He has further investigated certain ionic factors which influence the action of acetylcholine at the muscle endplate membrane. Reports on this subject were delivered at the New York Academy of Sciences Symposium, "Physicochemical Mechanisms of Nerve Activity," and at the spring meeting of the American Physiological Society. Working with Professor Nastuk, Mr. Lionel Grossbard, second year medical student, carried out a comparison of activity at the neuromuscular junction, of neostigmine and its diethyl analogue. Results indicate a possible clinical application of the analogue. In collaboration with Dr. James B. Campbell, Assistant Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, Professor Nastuk and Dr. Levine have initiated a study of neurosecretory activity occurring at the tip of regenerating peripheral axons. This work, made possible by development of a bioassay of great absolute sensitivity, has yielded encouraging preliminary results.

Professor Nastuk's work in the causation of myasthenia gravis continues to be focused on circulating agents which might have etiologic significance or which might be indicators of activity of the disease process. Work done in collaboration with many individuals, among them Dr. Arthur J. L. Strauss, now with the Department of Microbiology, and Mrs. Sarah Schuh, second year medical student, includes a study of the cytolytic activity and complement activity in serum obtained from patients with myasthenia gravis, some of them pregnant women. A progress report was presented recently by Dr. Nastuk at the Second International Symposium on Myasthenia Gravis held in Los Angeles. This work has received renewed support from the United States Public Health Service.

Professors Root and Nastuk are collaborating with the Department of Pharmacology in post-doctoral training in neuropharmacology under a

grant provided by the United States Public Health Service. Dr. Norman Kahn, trainee under this program, is investigating under Dr. Nastuk's guidance the action of thiamine in neuromuscular and axonal transmission.

Mrs. Barbara O. Alving, working under the direction of Professor Nastuk, completed her Ph.D. thesis on research concerning the blocking action of strychnine in neuromuscular transmission. The demonstration of the blocking action of strychnine at a cholinergic synapse is important in providing a more precise explanation of the central action of the drug. Mrs. Alving resigned on July 1, 1959, to accept an appointment as Instructor in Physiology at the University of Miami Medical School.

Mrs. Farnsworth, Dr. Corazon Gonzalez, International Cooperation Administration Fellow from the University of the Philippines, and Professor Gregersen have completed a study of plasma and red cell volume and the F_{cells} factor in the cat. Mrs. Farnsworth, working under the direction of Professor Gregersen, is now investigating renal blood volume under various conditions.

Professor Chien with the collaboration of Mr. Stuart Billig, second year medical student, has studied the changes in cardiac output and arterial pressure in sympathectomized animals during varying degrees of hemorrhage. With Mr. Bernard Hitzig, graduate student and teaching Assistant, he has determined the residual blood volume necessary for survival after hemorrhage in sympathectomized animals and, with Drs. Gregersen, Muelheims and Ruth A. Rawson, the effect of histamine on the distribution of cells and plasma in splenectomized animals. Professor Chien has also studied the development of supersensitivity in the superior cervical ganglion after its denervation.

Dr. Robert J. Dellenback and Dr. Muelheims have completed a study of red cell volume and distribution in different organs and tissues before and after bleed-out in the rat. Dr. Rowley and Dr. Dellenback have studied the effects of x-irradiation on the chemical composition of the rabbit brain and Drs. Dellenback, Rowley and Muelheims have investigated the sodium and potassium contents of rat hearts before and after administering acetylcholinesterase inhibitor. Dr. Dellenback, with the assistance of Miss Alice Rudolph,

research worker, has perfected the Warburg technique for study of brain tissue respiration and is currently investigating the influence of various ions, especially calcium, on the metabolism of the cerebral cortex in the rat.

Professor Root served as a Director of the New York State Society for Medical Research, as a member of the Advisory Screening Committee in Medical Sciences for Fulbright Fellowships, and also as a member of the Physiology Test Committee of the National Board of Medical Examiners. He was recently awarded the Armed Forces Medal by the Republic of China for his conspicuous service as Chairman of the Fellowship Committee of the American Bureau for Medical Aid to China. Professor Root has continued as Chairman of the Animal Care Committee of the Medical Faculty.

Professors Gregersen, Root, Walcott, and Nastuk attended the International Cardiovascular Symposium held by the National Research Council at the National Academy of Sciences in November, 1959. In March, 1959, Professors Cizek and Walcott represented Columbia University at the MEND Symposium held at the Naval Medical Center in Bethesda, and Professor Cizek has taken part in the program of instruction of the National Resuscitation Society.

Professor Nastuk is editor of two new volumes of *Physical Techniques in Biological Research*, now in preparation, to which Professors Chien and Gregersen are contributing the section, "The Volumetric Determination of Body Fluids." Professor Nastuk also continues to be active in the New York State Society for Medical Research of which he is a vice president. Professor Walcott is serving as a member of the Council of the New York Academy of Sciences.

Professor Cizek spent the Fall Semester of 1958 on sabbatical leave during which he worked at the library of the New York Academy of Medicine preparing papers relating to food ingestion, salt deficiency and fluid intake. During the Fall and Winter of 1958-59, he helped organize and, with Professor Chien and Dr. Muelheims, gave lectures in the course of applied physiology in the Seton Hall University post-graduate medical program. On his return, Professor Cizek trained Dr. Gonzalez in the techniques of renal physiology.

During March, 1959, Professor Gregersen delivered lectures at the National Taiwan University Medical College and the National Defense Medical Center in Taiwan, and also at the Tokyo University Medical College and at the Prefectural University of Medicine in Kyoto, Japan.

Psychiatry

LAWRENCE C. KOLB, *Professor and Chairman of the Department
Director of Service*

Since the last report, the department has suffered, yet takes pride, in major losses to the faculty. Professor Irville H. MacKinnon, who gave twenty-nine years of devoted service to the teaching and administrative activities of the department and served from February 1, 1930, to November 4, 1959, resigned his faculty position and retired as Assistant Director of the New York State Psychiatric Institute. Dr. MacKinnon was the Acting Executive Officer of the department from September 1, 1953, to June 30, 1954. He accepted the position of Superintendent of the Milledgeville State Hospital and Professor of Psychiatry at Emory University in Georgia. In these positions he takes on great responsibilities in reorganizing the mental health facilities of that state.

Professor Bernard Holland, Professor Robert Senescu and Dr. Robert Weiss resigned to accept, respectively, the posts of Professor and Chairman of the Departments of Psychiatry at Emory University, the Medical College of Virginia and Dartmouth Medical School. Their colleagues extend to them their congratulations and best wishes in assuming their new academic responsibilities.

Dr. Shervert Frazier, formerly Consultant in Psychiatry, Mayo Clinic, joined the department and, as of July 1, 1959, was appointed to the Joske Professorship with the academic rank of Assistant Professor. This professorship was established in the department through the wisdom and generosity of Mrs. Lucille J. Oppenheimer with the specific purpose of making available a junior chair for the training of men who have continuing interests in psychiatry as an academic or research career. This gift is in memory of Mrs. Oppenheimer's father, the late Dr. Alexander Joske.

Dr. Esther Davidson, formerly a Fellow of the Foundations' Fund for Research in Psychiatry at the Boston City Hospital and a native of England, also joined the department on the above date as a Research Associate. Dr. Davidson, with

her colleagues in England, has made fundamental contributions on the knowledge of the nitrogenous biochemical disturbance and the treatment of hepatic coma, particularly as seen in alcoholism.

The department regrets the resignations of Dr. Lothar B. Kalinowsky, Research Associate and Associate Attending Vanderbilt Clinic; Drs. Louis P. Carini, Lucille Ross and Miss Barbara Kohl-saat, Research Associates; Drs. Roy D. Craig and Edward S. Tauber, Associates and Associate Attendings, Vanderbilt Clinic; Drs. Mottram P. Torre and Alvin Goldfarb, Associates and Assistant Psychiatrists, Vanderbilt Clinic; and Dr. A. Louise Brush, Associate, Drs. Samuel Dunaif, Maria Z. Fuchs, Robert J. Mearin, Lester A. Gelb, and Alberta B. Szalita-Pemow, Instructors; Drs. M. Jean Jameson, Walter Stewart and Renatus Hartogs, Instructors and Assistant Attendings, Vanderbilt Clinic; Martin H. Wodin, Assistant, Drs. David N. Graubert, David N. Rudin and William F. Weber, Assistant Psychiatrists, Vanderbilt Clinic.

Teaching

During the past year, there have been a number of innovations in the teaching program. These involve the instruction of the medical students of the College of Physicians and Surgeons and also the development of a new affiliated psychiatric residency training program with the Bronx Veterans Administration Hospital, an expansion of the affiliated residency training program with the nearby State hospitals, and growth in the affiliated residency training program of the Psychiatric Institute and Presbyterian Hospital. Equally important was the initiation of the intern training program in clinical psychology and a period of psychiatric instruction for all residents in neurology for a period of three months on the clinical services of this department.

Perhaps the most significant movement in the instruction of the medical students has been the

provision of a large number of research stipends by the National Institute of Mental Health. During the past year, twelve medical students held such stipends and two others received similar stipends from the Foundations' Fund for Research in Psychiatry, New Haven, Connecticut. These students participated in the various investigative activities described later in this report. In some instances, these students gave the majority of their time to research, while in others a greater proportion of time went into elective clinical work. Two of the students were able to complete short studies and received awards at the end of the year. Alexander Weech, currently in his fourth year, supervised by Drs. Holland and Roizin, was awarded the Smith, Kline and French prize for a paper on "Endocrine effects of chlorpromazine in albino rats," and Susan Standfast received the Prize in Psychiatry for the Second Year Class for her thesis on "A Questionnaire Study of the Characteristics of Stuttering and Stutterers in relation to the Etiology of Stuttering."

The modifications in the curriculum that pertained to instruction in psychiatry were put into effect during the eighteen months. Thus the first year class was exposed to an additional ten hours of instruction in the course on human behavior. The faculty elected to devote every fourth session to small group discussion as an innovation. Also the department has participated in the new course on structure and function of the nervous system. Professor Glusman and Dr. Samuel Sutton have presented material on the neurophysiologic basis of emotional responses and the higher integrative functions of the cerebral cortex particularly as it relates to conditioning and learning.

Following negotiations with the Veterans Administration, an affiliated psychiatric residency training program was arranged in which six residents from the Veterans Administration Hospital in the Bronx were sent to the New York State Psychiatric Institute for special instruction in the care of women and children. Professor Bernard Pacella has been assigned to the Veterans Hospital in charge of this training program. This affiliation expands the clinical experience and provides supervised psychotherapeutic work for the residents of the Veterans Administration Hospital that they would not otherwise obtain.

The affiliate residency training program for psychiatrists of seven downstate hospitals of the Department of Mental Hygiene continued with thirty-five participants in the first year of formal instruction. This course has been expanded to include advanced work in a second and third year for residents of these hospitals. In addition to the instruction given by faculty members at the State hospitals in the second year, the directors of the various State hospitals now select certain candidates for instruction in psychotherapy in the outpatient department of Vanderbilt Clinic where personal supervision is given in short term therapies as well as intensive continuous treatment with a limited number of psychoneurotics, borderline psychotics, psychosomatic cases and child psychiatric problems that are not seen in a state hospital setting.

The post graduate courses in neurology and psychiatry, given under the joint auspices of the Departments of Psychiatry and Neurology of the College, were held from October 6th to December 12th, 1958. The course was attended by nineteen psychiatrists from the various New York State hospitals of the Department of Mental Hygiene and additional physicians from outside the state.

The Psychoanalytic Clinic

The curriculum of this clinic has been under special study over the last year, leading to the addition of several new courses and changes in emphasis in others. The second year course, "Psychoanalytic Study of Children" has been shifted to the first year to emphasize its importance in the understanding of basic personality development. Arrangements have been made for presentation of child patients as a part of the course. A children's service has been established to provide the second year candidates with earlier practical experience under supervision in therapy of child patients rather than as in the past during the fourth year. An extended series of courses in psychoanalytic technique will replace the former course. The first semester of the second year, Professor Lionel Ovesey will deal with management of the opening phase of therapy. In the second semester, Professor Aaron Karush will discuss the management of the psychoanalytic process from opening to termination of treatment and, in the

third year, Professor Easser will cover special problems related to various diagnostic categories. Professor Nathan Ackerman will continue his consideration of strategy and tactics as a part of the program.

The Department of Psychiatry and the Clinic invited Dr. Gregory Bateson, part-time Visiting Professor at Stanford University, Department of Sociology and Anthropology, to spend two days here to demonstrate family interviewing and discuss his hypotheses in regard to schizophrenic communication. Dr. Abram Kardiner gave the Rado Lectures in January of 1959 on observations on the integrative process.

A recent survey of 108 graduates of the Psychoanalytic Clinic indicates that the broad scientific objectives originally envisaged for a university graduate school in psychoanalysis are being realized. Four graduates are now professors and chairmen of departments of psychiatry, eighty-five held academic appointments in 1958-1959, seventy-two graduates are teaching psychiatric residents in university or state mental hospitals or veterans facilities, and fifty-seven are currently engaged in research.

Community Psychiatry

The Division of Community Psychiatry extended and consolidated teaching activities in two areas, the first with respect to mental health teaching for the general students in the School of Public Health and Administrative Medicine and the second with respect to the various interrelated training programs in administration, public health and community psychiatry for psychiatrists.

Many curriculum modifications were made during the academic year. Arrangements were established for Drs. Robert C. Hunt and Francis J. O'Neill, Lecturers, and Louis Linn, Instructor, to plan, discuss, and approve the field projects and to share among themselves the faculty field visits to the administrative psychiatrists during their project year away from campus. Mr. Harold Baumgarten has joined these faculty members in their work, both in relation to the project committee work and the field visitations as a representative of the hospital administration faculty. Each administrative psychiatrist, therefore, now has a faculty committee for his project year, consisting of Mr. Baumgarten and one of the three

psychiatrists mentioned. The director, Professor Viola Bernard serves on these committees as chairman.

The supervised field placement program for trainees in this division has been designed, and put into action for the first time this year in five settings, i.e. the Westchester County Community Mental Health Board, the Bank Street College of Education, the Louise Wise Services (Adoption Agency and Agency for Case Work and Maternity Shelter Help to Unmarried Mothers), Vanderbilt Psychiatric Clinic and Columbia-Washington Heights Community Mental Health Project.

Clinical Psychology

The training program for clinical psychologists was initiated on September 1, 1958, with the appointment of two trainees supported by stipends provided under the grant to the College from the National Institute of Mental Health and another traineeship, provided by the New York State Department of Mental Hygiene. Each trainee was assigned for clinical experience in rotation within the medical center to the Vanderbilt Adult Psychiatric Clinic, the Neurological Institute, the Pediatric Psychiatric Clinic and the Psychiatric Institute.

Other Paramedical Teaching

The department has been responsible for providing instruction for many years to psychiatric social workers, nurses, occupational therapists and psychologists. These programs of instructions are carried out for the most part with the service departments of the Psychiatric Institute. A more formal recognition of the connection with the College was established several years ago when the nurse instructors of the Psychiatric Institute were given academic rank in the Department of Nursing of the College. It is hoped that similar recognition and closer affiliation will be established for those who instruct in the fields of social work and rehabilitation. It may be mentioned that 179 basic collegiate nursing students from the College and also Skidmore College, completed a twelve week course in psychiatric nursing given at the Psychiatric Institute. New York University sent ten nursing students for field practice to the Institute during the year.

Research

Since the last report, a number of new investigations have been initiated. It is gratifying to observe the active participation in research of new and younger members of the faculty and also of medical students who have been awarded the stipends of the National Institute of Mental Health and Foundations' Fund for Research in Psychiatry. During 1958, eight students received such awards. In 1959, the number was fourteen, with two students visiting from the Women's Medical College, Philadelphia and St. Louis University, St. Louis, Missouri. Each student was assigned to a faculty preceptor with whom he worked. The research preceptors for the students were Professors Franz J. Kallmann, Hilde Bruch, William Goldfarb, Murray Glusman, Bernard Holland, Shervert Frazier, Sidney Malitz, Leon Roizin, Morris Zelditch and Dr. Joseph Schachter. The subjects of investigations ranged from language disorders and communication in schizophrenia and the effect of 5 hydroxy-tryptophane on animal behavior.

Of the new research activities, the following are recorded. Dr. Joseph Schachter completed a methodological review of problems in the physiological study of human emotional behavior. A laboratory for the physiological responsivity of neonates has been developed in the Presbyterian Hospital to the point where preliminary measurements are being performed on digital blood flow, general bodily activity, blood pressure and respiratory rate on neonates. Plans have been established to initiate a longitudinal study of emotional behavior with a small number of neonates and their families.

Professor Arthur C. Carr and Dr. Bernard Schoenberg are studying the indications and effectiveness of a brief psychotherapy for patients with neurodermatitis. Drs. Carr, Zelditch and Schoenberg are engaged in preliminary work on a research project concerning the character of resistance in group psychotherapy. The project is designed as a long-range evaluative study of group processes and will attempt to clarify the concepts of group resistance.

Dr. O'Connor has commenced work with Dr. Daniel L. Larson, Assistant Professor of Medicine and Assistant Attending Physician and Dr.

Arthur Snyder, Assistant in Medicine and Assistant Physician, Dr. Robert A. Fishman, Assistant Professor of Neurology and Assistant Attending Neurologist, in the Special Arthritis Clinic of the Vanderbilt Clinic for the express purpose of examining the personality disturbances in detail in lupus erythematosus. An on-going study of this particular illness is planned in order to learn more of the natural history and the development of the psychiatric manifestations of the disease.

Dr. Schoenberg has completed a study on the treatment by group psychotherapy of patients with multiple somatic complaints. The group of patients treated by this method showed a significant decrease in complaints and clinic visits and an increased ability to deal with interpersonal problems.

The Division of Clinical Psychology, under the leadership of Professor William N. Thetford, has initiated a number of research projects concerned with the "body image." Among these investigations are studies of the relationship between physiological reactions occurring during adrenalin infusion and induced modifications of response to various psychological tests, as well as examination of the associated subjective feelings about the subject's body parts. A current area of investigation is the degree of familiarity which individuals have with their own bodies and the positive or negative values they attach to various bodily parts.

Dr. Alan M. Mesnikoff has completed a study of patients with Gilles de la Tourette's syndrome treated by psychotherapy and chlorpromazine. With Professor Bruch, he has been examining the psychogenetic determinants of anorexia nervosa in several rare male patients with this condition. Professor James Cattell has continued his long-term observations of that group of patients classified as pseudoneurotic schizophrenia. He also is engaged on a study of patients with idiopathic oral lesions, in collaboration with Drs. Carlos J. Dalmau and Edward V. Zegarelli, Robinson Professor of Dentistry and Attending Dental Surgeon.

New York State Psychiatric Institute

Professors Kolb, Carr and John D. Rainer with Dr. Mesnikoff, have continued their biological, psychological and psychoanalytic studies of

sets of identical twins with divergent sexual development, one of each set being overtly homosexual and the other heterosexual. The differential factors in the sexual behavior now appear to be related to the early varying parental attitudes toward the individual members of the twin sets determined both by the parents' capacity to discriminate one from the other due to certain individual bodily characteristics and the parental fantasies and wishes for the unborn or newborn children which conflict with the biologically determined sex of the twin pair and the influences of these parental fantasies and attitudes on the growing twins' concepts of their bodies and sexual roles. It has been observed that the sexual role is unrelated to the variety or degree of psychopathology found in the individual. Four sets of identical twins with divergent development of sexual role have been found to date.

The research activities of Professor Kallmann and his associates have remained focused on the statistical processing of longitudinal health and longevity data on 2,536 twin subjects over age sixty (Professor Irving D. Lorge of Teachers College and Drs. Lissy F. Jarvik and Arthur Falek) and on the investigation of various special groups encountered in a New York State sample of nearly 12,000 deaf adolescents and adults (Professors Deming and Rainer and Drs. Kenneth Z. Altshuler, George S. Baroff and Michael M. Klaber). The special series of completely deaf subjects and their families included psychiatric disorders, delinquents (especially sex offenders), achievers, and twins, with a total of more than 1,100 family units. In another series of approximately 950 deaf adults from the general population (non-hospitalized), detailed information was obtained about variations in mating and fertility patterns and the norms of adjustment to residential school facilities and community life restrictions.

The mental health program for the deaf recommended by Dr. Kallmann and his staff was presented before various medical specialty groups and enthusiastically endorsed at two special research conferences. One was held at the Psychiatric Institute for leaders of local and national organizations for the deaf in order to acquaint them with the need for specialized psychiatric services for this severely handicapped group. The

second conference held at the New York Academy of Medicine, was organized as an international symposium on "The Differentiation of Current Mating and Fertility Patterns" and was attended by many experts in the medical, demographic and biological sciences concerned with population problems. The proceedings of both meetings were published as copyrighted research reports.

Professor Carney Landis and his associates are attempting to test the efficiency of the central nervous system by means of simple psycho-physiological measures; an expanded test battery was applied to hospitalized mental patients who were undergoing therapy with various tranquilizing agents.

Professor Zubin's Division of Biometrics has continued its investigations attempting to relate performance to various test devices to the prognosis of mental disorders and the evaluation of outcome of illness. A specially designed ward-behavior rating scale has been devised and printed in final form by Dr. Eugene I. Burdock for the use of ward attendants and nurses in recording objective observations of patients' ward behavior. Dr. Kurt Salzinger continued his studies with the reinforcement interview to measure expression of affect. He has found that schizophrenics show a faster decrease than normals in the number of affective utterances which they give after reinforcement is withheld. Within the schizophrenic group, the patients who respond to reinforcement tend to have the better outcome. Dr. Sutton and Mr. Gad Hakarem are collaborating with Dr. Otto Lowenstein in investigations of pupillography. They have found that the pupil diameter of hallucinating male schizophrenics is smaller than that of their normal controls. Dr. Sutton and Mr. Richard Chase, with Dr. Edmund P. Fowler, Jr., Professor of Otolaryngology and Director of Service, are investigating delayed auditory feedback effects on speech. They have found that key tapping is affected in a similar manner to speech by delayed auditory feedback. An attempt at getting at a new range of indicators for prognosis in schizophrenia and also determinants of adolescent friendships which develop in schizophrenics as contrasted with normal controls has been undertaken with the collaboration of Professors Kolb and Zelditch. A psychiatric

resident, Dr. Donald S. Kornfeld, and a sociology student, Mr. Raymond Pitts, are participating in this research. Dr. Kornfeld and Mr. Pitts are also the active participants in a new technique for fractionating a group of schizophrenics into like-minded or like-structured subgroups. This has been applied to the prognostic data collected during the past several years and several new tentative subgroups have been isolated, characterized by similarity in their pattern of performance on psychological tests and background variables.

Professor Warren M. Sperry continues his search for methods applicable to the separation of the unsaponifiable lipids of brain, as has Professor Herbert L. Meltzer his application of his three phase countercurrent fractionation method to the separation of gangliosides from brain. Professor Benjamin Weiss has synthesized dihydrosphingosine — 1, 3, — cyclophosphate and other derivatives of sphingosine and dihydrosphingosine. Dr. George J. Alexander, Associate in Biochemistry, has shown that serine stimulates the transfer of methyl groups from methionine to diaminethanol to form choline by serving as an acceptor of the homocystein moiety of methionine.

Professors Heinrich Waelsch and Abel L. Lajtha, in collaboration with Drs. Soll Berl and Genkichoro Takagaki, are continuing the study of amino acid and protein metabolism in the nervous system. An unexpected rapid rate of the conversion of glutamic acid to glutamine in the central nervous system was found. The problem of compartmentalization of biosynthetic processes is being studied on the further example of hippuric acid synthesis with Dr. David Garfinkel. The metabolic changes occurring in epileptogenic lesions are being analyzed with Dr. Berl in collaboration with Dr. Dominick Purpura, Associate Professor of Neurological Surgery, and Dr. Harry Grundfest, Associate Professor of Neurology. In lesions produced by the Morrell technique, a concomitant decrease in glutamic acid, glutamine, and glutathione has been found, without a change in the concentration of γ -aminobutyric acid. Professor Waelsch, with Drs. Mary J. Mycek, Donald D. Clarke and Amos Neidle, is examining the properties of the amine incorporation system recently discovered in this laboratory.

Professor Roizin, with Professor Malitz and their associates, are collaborating on a multidisciplinary

approach to the study of the action of various psychopharmacological agents in acute and chronic animal preparations, hospitalized patients and outpatients. Dr. Magdalena Berger, Research Associate in Biochemistry, has also made progress in her study on the oxidative phosphorylation of brain mitochondria. Dr. Reginald Taylor, Associate, pursues his study with Professor Sperry on the perfusion of the brain in situ, isolated as to its blood supply with nerve connection intact. Professor Glusman with Professor Joseph Ransohoff, Associate Professor of Clinical Neurological Surgery and Associate Visiting Neurological Surgeon, is examining the effects of drugs upon hypothalamic "rage" in animals. Also in collaboration with Dr. Sidney C. Werner, Associate Professor of Clinical Medicine and Associate Attending Physician, Dr. Glusman has been studying the effects of hypothalamic stimulation on blood adrenalin and nor-adrenaline levels in the animal with deep implanted electrodes.

Professor Bruch formulated two research projects. One deals with the expressive significance of the speech patterns of anorexic, schizophrenic and phobic patients in relation to the intrafamilial influences; the speech patterns of both the patients and parents are to be examined. The other project deals with the parental functioning of former fat children who had been extensively studied fifteen to twenty years ago in the Department of Pediatrics. The goal is to discover whether and how the distorted attitudes toward bodily needs and functions of such parents (formerly fat children) are transmitted to their own children.

Dr. Lenore M. Kopeloff, who has been working with experimental epilepsy in the monkey and the mouse, has screened various inorganic substances in respect to their epileptogenic activity, as well as examined different techniques of brain application, the characteristics of cerebral lesions from which seizures arise and the effects of various drugs occurring naturally in the body in the course of the induced convulsive state. Dr. Joseph G. Chusid of St. Vincent's Hospital has collaborated with her.

Drs. Sheldon G. Gaylin and Herbert Hendin have commenced to delineate the process of the adaptive approach in the treatment of homo-

sexuality, a technique that has proven successful with a number of patients. Professors Daniels, Karush, Moses, and Dr. O'Connor pursue their follow-up study of patients with ulcerative colitis who received psychotherapy. Over the last four years, members of the faculty under the leadership of Dr. Abram Kardiner have undertaken a fundamental critique of Freudian theory. The first of three separate sections of the basic study has been completed under the title of "A Methodological Study of Freudian Theory," by Professors Kardiner, Karush and Ovesey.

The Mount Sinai Hospital

During the past year the emphasis of the department has been focused on the residency training program. Professor Harry Weinstock has full responsibility for the training program for the residents in adult psychiatry. Dr. Louis Linn is directly in charge of the psychiatric ward and the teaching program.

Under a grant from the United States Public Health Service, a postgraduate course in psychiatry for general practitioners has been established.

Among the research projects in progress, completed, or published, are the following: The studies on the after-contraction as a measure of the "Inhibitory Process" by Drs. Sapirstein, Robert Jaffe, and Stanley Bernstein who have studied the after-contraction phenomenon.

Drs. Charles Fisher, Stanley Friedman and William Dement continue their investigations on dreams, images and perception. This investigation is primarily concerned with the influences of tachistoscopically administered sub-threshold stimuli on the formation of dreams, images, hallucinations and other autistic phenomena. It is planned to extend the experiments to children, eidetic subjects, hypnotic subjects and the brain-injured. Dr. Friedman is interested in completing a validation study of the Urbantschitsch phenomenon.

Dr. Dement is examining the fundamental significance of the phenomenon of dreaming, as its occurrence has been defined by the eye movement technique, to the physiological and psychological economy of the individual. He now intends to investigate the dynamics of the totality of a night's dreaming.

St. Luke's Hospital

Two full-time fellows in child psychiatry, two part-time fellows in child development and six theological students are in training. A comprehensive course in basic psychiatry was given to the nurses and theology students (Union Theological Seminary, Department of Pastoral Counseling) by the residents and attending psychiatrists under the supervision of Professor Benjamin H. Balser who has recently assumed the directorship of the teaching programs in psychiatry.

A principal research undertaking has been the continuance of the project on child schizophrenia and mental retardation.

Manhattan State Hospital

Professor Nobe Stein has continued the instruction of the third year medical students in the psychopathology of the chronic brain syndromes and functional psychoses. Dr. Herman Denber, Instructor, has pursued his clinical investigations on the effectiveness of a variety of pharmacological agents and also his interest in the therapeutic community in the treatment for the chronically institutionalized.

Rockland State Hospital

Professor Nathan Kline and his colleagues have designed a special ward for research observation of patients which, it is believed, will provide a prototype for other research units. This area, now under the supervision of Dr. George Simpson, Assistant, allows almost continuous observation of all patients in addition to facilities for recording behavior, as desired. Construction will be started in the immediate future.

In collaboration with Dr. Elliot Chapple, Drs. Kline and J. C. Saunders undertook studies to determine the fundamental behavior characteristics of schizophrenic patients and also to identify the specific behavioral changes which occur in patients during the course of administration of both "tranquilizing" and "energizing" drugs by utilizing the technique of the interaction chronograph.

During the present year, methods were developed to measure heart rate accurately from beat to beat; respiration by means of a chest circumference indicator; and to record both above quantities on tape for storage and playback at different

speeds. The relation between heart rate and respiration was investigated. By means of analog computer studies, the correct differential equations describing these relations were determined. The physiological meaning of these equations demonstrated the existence of two separate reflexes induced by stretch receptor responses rather than by hemodynamic factors. The significance of the laws thus established with regard to the problems of disease, aging, and proper homeostatic functioning is to be further investigated. As an ancillary to the work with psychopharmaceutical agents, funds were obtained and a clinic established at Port-au-Prince, Haiti.

Henry Hulseon Center for Child Research

Professor Goldfarb is planning the construction of a day hospital. Funds for the support of the personnel and the treatment program will be supplied by the New York State Interdepartmental Health Resources Board. It is hoped, too, that teaching staff will be supplied by the New York City Board of Education. The research plan is so designed as to compare the functional effectiveness of day facilities with inpatient facilities for treatment of severely disordered children who have heretofore been placed in inpatient facilities.

Special Activities

The Alumni Association of the Columbia University Psychoanalytic Clinic had its first Alumni Day on Saturday, May 23, 1959, at the New York State Psychiatric Institute. Some former members of the clinic participated in a scientific session.

A research conference on Rehabilitation and Management of Mental Disorders was held at Psychiatric Institute on June 3, 4, and 5, 1959.

Dr. Paul H. Hoch was presented the First Annual Nolan D. C. Lewis award of the Board of Managers of the New Jersey Neuro-Psychiatric Institute for outstanding contributions to the field on September 17, 1958.

Dr. Bernard L. Pacella of New York has received one of Italy's highest civil decorations. He was awarded the "Cavaliere Ufficiale 'nell Ordine al Merito della Repubblica'" — an Italian Government decoration for special merit in the fields of science, letters, arts or economics.

Dr. Kolb acted as visiting Professor at the University of Oklahoma and at the University of Kansas. He delivered the Alpha Omega Alpha Lecture at the former and the Gibson Lecture at the latter. Also, he was elected President of the Association for Research in Nervous and Mental Disease, a Councillor of the American Psychiatric Association, a Trustee of the Foundations' Fund for Research in Psychiatry and Vice-President of the Medical Board of the Presbyterian Hospital during the year.

Dr. William Langford continued to serve as President of the American Academy of Child Psychiatry and as Chairman of the Policy and Planning Committee of the American Orthopsychiatric Association. He was appointed to the Child Psychiatry Advisory Group of the American Board of Psychiatry and Neurology, concerned with preliminary activities directed toward certification in the sub-specialty of child psychiatry.

Dr. Kallmann continued to serve as member of the Board of Directors of the American Eugenics Society and of the Organizing Committee for the second International Congress of Human Genetics, while Dr. Rainer shared in the 1958 R. Thornton Wilson Prize awarded for a notable contribution to genetic or preventive psychiatry.

Dr. Waelsch acted as Editor of Journal of Neurochemistry and of Psychopharmacologia. He was appointed to the Scientific Board of the National Association for Mental Health, Inc.

Dr. Zubin was appointed a member of the Psychopharmacology Review Committee of the Psychopharmacology Service Center of the National Institute of Health.

Drs. Roizin, Eros, and their colleagues, shared with four other recipients, the R. Thornton Wilson award given by the Eastern Psychiatric Research Association for a paper entitled "Histopathologic findings in the liver and central nervous system following the administration of some tranquilizing drugs in humans."

In May, 1958, at the Annual Meeting of the American Psychiatric Association, Dr. Joseph Schachter, Research Fellow of the Department of Mental Hygiene, was given honorable mention for the Hofheimer Award for Research in Psychiatry, of the American Psychiatric Association, for his work on hypertension.

Public Health and Administrative Medicine

RAY E. TRUSSELL, *DeLamar Professor and Chairman of the Department*

The changing nature of public health practice, the need for more specialized personnel to attack major unresolved public health problems, the merging streams of traditional health department activities and the medical care needs of large segments of the population, the public concern with medical care, its organization and its costs, the impact of union-management decisions in purchasing medical care, the rapidly changing concepts of care of the mentally ill — all these factors and others are reflected in the following reports. The School's curriculum, faculty, student body and research activities also reflect such realities and will continue to adapt to the priorities of our time.

Since one of the most important functions of the School of Public Health and Administrative Medicine is to prepare professionally trained personnel for public service, a large part of the teaching and research conducted by the Faculty is in the community and in fact in many parts of the world. As always, the School is indebted and grateful to the many individuals and organizations who cooperate so wholeheartedly in making this possible.

The past year and a half have been characterized by expanding educational functions, completion of some important research and educational projects, and initiation of new research activities. This, in turn, has aggravated an already difficult space problem which, in turn, is now nearer solution because of two recent and generous gifts from the Avalon and New York Foundations totaling half a million dollars.

The federal traineeship programs created because of a scarcity of certain key personnel have had an impact on schools of public health and this school is no exception. The School has the largest number of graduate students in its history — a class size which reflects our usual courses leading to a Master of Public Health or a Master

of Science in hospital administration and, in addition, special training programs in biostatistics, community psychiatry, epidemiology, maternity nursing, nutrition and parasitology and tropical medicine. The specialized training in community psychiatry is an inter-departmental program with the Department of Psychiatry; the maternity nursing course is a cooperative program administered by the Department of Nursing.

Professor Trussell has continued with research activities in administrative medicine. During the past year and a half, a preliminary survey of medical care secured under collective bargaining was completed with Dr. Josephine Williams serving as project administrator. The report of this pilot study to the Foundation for Employee Health, Medical Care and Welfare which had financed the work, led to a nationwide survey of the medical care experience of 3,000 union members (and their families) under four different types of health insurance. This study for the Foundation will be completed in the fall of 1960.

A similar survey of the medical care experience of New York City hotel workers and their dependents was completed for the Union Family Medical Fund of the Hotel Industry. Miss June Sachar was project administrator. Based on the results of the survey and recommendations of Mr. Martin E. Segal who is consultant to the Fund, a decision was made to establish a medical care program for hotel workers and dependents, which is intended to overcome the reported deficiencies.

The School and the Foundation on Employee Health, Medical Care and Welfare are jointly sponsoring a national conference next March on medical care secured under collective bargaining. This conference will involve some national labor leaders, some industrialists, and national and local representatives of medicine, hospitals, pre-payment and commercial health insurance, the pharmaceutical industry and others concerned with

the decisions made by labor and management.

Dr. Trussell has directed a study of the non-profit prepayment plans in New York State for the State Department of Insurance and the State Health Department. A research group of twenty full-time and part-time personnel have been analyzing the problems and future of eight Blue Cross Plans, seven Blue Shield Plans and three independent medical and dental plans. The first report dealing with the eight Blue Cross Plans has been submitted to the State.

A three year study of medical care in Puerto Rico is being conducted jointly with the local research team under the auspices of the Department of Health of the Commonwealth of Puerto Rico. It is nearing completion. Several of the research workers in Puerto Rico are graduates of the School of Public Health and Administrative Medicine and five faculty members, including Dr. Trussell, have been working with the local group. An Advisory Committee to the Secretary of Health and the Governor is considering the results and attempting to arrive at decisions as to what course the government should follow regarding medical care in the future. More than two-thirds of the people in Puerto Rico are completely dependent on public medical care. This work has been supported by appropriations by the Puerto Rican Legislature and a supplemental grant from the Rockefeller Foundation.

Dr. Trussell served as Chairman of a national conference on Mental Health Teaching in Schools of Public Health. This appraisal of the effectiveness of training grants to Schools of Public Health was financed by the National Institute of Mental Health and involved six working committees providing pre-conference study documents followed by a week long conference at Arden House at which time the committee members were augmented by additional specialists from public health, psychiatry and related disciplines.

Dr. Trussell is a member of the Governing Council of the American Public Health Association and also a member of its Committee on Professional Education. He continues to serve as member of the Temporary Health Insurance Board for State employees and as a member of the Medical Education Advisory Committee of the Kellogg Foundation. In the past year he was appointed to the Master Plan Committee of the

Hospital Council of Greater New York and served as part-time Executive Director of the Mayor's Commission on Health Services of New York City. He has also been appointed by the President of the American Board of Preventive Medicine to serve as Chairman of a committee which will develop standards, recommended residencies and examination content for certification of physicians in the field of medical administration. This is an important development to the field of administrative medicine because physicians who select an administrative career frequently find themselves without a specialty field identified as such unless they work within the traditional public health confines or become certified in one of the clinical specialties. The decision on the part of the American Board of Preventive Medicine to bring this group of physicians into eligibility for certification is an important step forward because of the great need for physicians with administrative interests in view of the inevitable pressures for further organization of medical care and prepayment in the future.

Division of Biostatistics

The teaching activities of the division were similar to those of previous years insofar as the public health students were concerned. The teaching program was strengthened by the temporary appointment in 1958, of Mr. Robert Israel as Instructor in Biostatistics and by the appointment in 1959, of Mrs. Ruth Gold as Instructor. Dr. George Saiger, Assistant Professor of Biostatistics, resigned his position with the division as of October 1, 1959, to undertake a teaching assignment in epidemiology.

Dr. Agnes Berger has been working with Mrs. Ruth Gold in the adaptation of large sample theory to the evaluation of follow-up data. They also prepared an addendum to a publication on non-parametric methods. Dr. Berger and Miss Elza Berquo from Brazil worked on a synthesis of the application of sequential analysis to medical research. Dr. George Saiger has been working on bioassay techniques, the applicability of certain multivariate techniques to medical research and has continued prior research on the biological effects of radiation. Dr. Fertig has continued his collaboration with Dr. Neal Chilton on statistical methods in dental research, under a

grant from the National Institutes of Health. He has also continued work on methods for assessing the results of repeat experiments. Some of this latter work is being extended by Dr. Khalil El-Kashlan.

The division has participated in a large number of consultations to the research workers of the Medical Center, of the New York State and City Health Departments and of various other community projects such as Rockland State Hospital and the Hartford Project of the Community Obstetrical Study. The participation of some of the more advanced trainees in these consultations has been invaluable. Some of the studies with which the division has been more closely associated have been those of Dr. Norah Tapley, Assistant Professor of Radiology and Assistant Attending Radiologist, on retinoblastoma; Dr. Harold M. M. Tovell, Associate in Obstetrics and Gynecology and Assistant Obstetrician and Gynecologist, on cancer implantation studies; Dr. George A. Hyman, Associate in Medicine and Assistant Physician, on iron disappearance curves; Dr. Nicholas P. Christy, Associate in Medicine and Assistant Physician, on his ACTH studies; Dr. Shin-Chun Wang, Professor of Pharmacology, on bioassay; and Dr. William A. Silverman, Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician, on premature infants.

Members of the division attended various professional meetings during the past eighteen months. Professor Fertig spent two months in 1958, and six weeks in 1959, in South America under the auspices of the World Health Organization visiting various medical centers and attending a Round Table on the Teaching of Medical Statistics. Dr. Saiger spent two months in 1959, lecturing and studying in bioassay at the University of Aberdeen, Scotland under a Rockefeller Foundation fellowship. Professor Fertig also serves as Chairman of the Advisory Committee on Epidemiology and Biometry of the United States Public Health Service.

Division of Community Psychiatry

The Division of Community Psychiatry, in cooperation with the corresponding division in the Department of Psychiatry, both under the direction of Dr. Viola W. Bernard, Associate Clinical

Professor of Psychiatry and Associate Attending Psychiatrist, extended and consolidated teaching activities in two main categories, the first with respect to mental health teaching for the general students in The School of Public Health and Administrative Medicine, and the second with respect to the various interrelated training programs in administrative, public health, and community psychiatry for psychiatrists.

Several changes in staff have taken place in the last eighteen months. Dr. Louis Gilbert, Associate Attending Psychiatrist in Child Psychiatry, was assigned to the Division of Community Psychiatry. Dr. Mottram Torre resigned his position as Associate in Psychiatry as of June 30, 1959. Miss Sylvia Utensky, Assistant in Administrative Medicine, also resigned at the end of the academic year. Dr. David Sanders was appointed Instructor in the Department of Psychiatry, assigned to this division, on July 1, 1959, and Miss Helen Trimpe was appointed Assistant to the Director of the Division on the same date.

Division of Epidemiology

The epidemiology traineeship program financed by the United States Public Health Service, is now in its third year. Seven full-time trainees including four physicians, one dentist, and two social scientists received stipends during the academic year 1958-1959. Four of these individuals have completed the program: Dr. Khairia Omran has returned to Egypt; Dr. Frances R. Gearing, Instructor in Epidemiology, and Mr. Joseph Greenblum, Assistant in Epidemiology, are working full-time in the School; and Dr. W. D. M. Harris is with the New York City Department of Health and is serving as an Instructor in this Division. Three of the 1958-1959 trainees are continuing with their training and a fourth, a physician who earned his M.P.H. last year, entered the full-time program this September. Activities carried on in the training program include formal course work, participation at staff conferences and in the teaching program, and research.

Additions to the staff include two instructors, Dr. Frances Gearing appointed in April, 1959, and Dr. William Douglas Mortimer Harris appointed in July of the same year. Dr. Fred Rogers received an appointment as a Lecturer in July, 1959. Dr. George Saiger, Assistant Professor of

Biostatistics, was nominated for the position of Associate Professor in Epidemiology in October, 1959.

The division has continued its interest in hypertension and cardiovascular disease. Dr. Gearing is director of a joint program with Dr. George A. Perera, Professor of Medicine and Associate Attending Physician, and Dr. E. Gurney Clark, Professor of Epidemiology, in a study of hypertension among relatives of hypertensive patients. Professor Morton Schweitzer and Dr. Gearing completed a pilot study of deaths from coronary artery disease in selected health areas of New York City, and Dr. Harris finished a study of blood pressure variability in relation to food intake. Three of the medical student trainees studied blood pressure variability in Liberia under the division's direction. Other studies in this field are in the planning stage and members of the division have continued their activities in the Epidemiology Planning Committee for Cardiovascular Disease which meets regularly to bring together epidemiologists and others interested in epidemiological studies from many different organizations.

Dr. Robert H. Thompson has been directing his attention to the epidemiology of dental disease in collaboration with members of the School of Dental and Oral Surgery and Dr. Edith Bramwell Reilly, another trainee, has been collaborating with the New York City Health Department in a study of lupus erythematosus. The Interdepartmental Mental Health Research Seminar, including five members of this Division, met weekly during the academic year, 1958-1959.

Professor E. Gurney Clark conducted a questionnaire analysis of present venereal disease problems in the United States and has continued to act as a consultant in this field to the American Social Hygiene Association and the Venereal Disease Program of the Public Health Service. He serves on the Expert Advisory Panel on Venereal Diseases and Treponematoses of the World Health Organization and on a similar committee of the Regional Office of the International Union against Venereal Disease and Treponematoses. He also serves as consultant to Public Health Reports, to the Health Information Foundation, to the Training Branch of the United States Public Health Service Communi-

cable Disease Center and to the American Board of Preventive Medicine. Dr. Clark is Chairman of the Epidemiology Section and a member of the Governing Council of the American Public Health Association. He is also a member of the subcommittee on Communicable Disease Control of the same organization.

Professor Anna C. Gelman has contributed editorial assistance to Dr. Jacques May in his book "The Ecology of Human Disease" and has collaborated on his second volume, at present in press.

Division of Medical Care Administration

The curriculum in administration and medical care required of most students in the School continues to undergo change. A new course, Economics of Health Services, was introduced in November, 1958, as the responsibility of Dr. Charlotte F. Muller, an economist serving as Research Associate in Administrative Medicine. Plans are now proceeding for the addition early in 1960, of a course in labor relations designed to meet the needs of administrators of health services in general and of those involved in planning or administering medical care programs initiated by collective bargaining agreements specifically. This course will be under the direction of Professor Donald Straus.

Professors Sloan and Harold Baumgarten, Jr. have initiated a placement and counseling service for hospital administration students and alumni. Professor Clay was in Brazil during June and July, 1958, as a Visiting Professor of Hospital Administration at the University of Sao Paulo under the exchange program sponsored by the W. K. Kellogg Foundation. During his stay, he participated in the Second National Congress of Hospitals in Belo Horizonte.

Dr. Jose G. Borba, Assistant Professor of Hospital Administration at the University of Sao Paulo, was the Visiting Professor from Brazil in the Fall of 1958. The exchange professor in 1959, was Dra. Lourdes de Freitas Carvalho, Associate Professor of Hospital Administration at the Sao Paulo University and Administrator of the Orthopedic Hospital in the University Medical Center.

Mr. Donald Straus, Executive Vice President of the Health Insurance Plan of Greater New

York has been added to our staff as Adjunct Associate Professor of Administrative Medicine. Dr. Edward A. Suchman was appointed Visiting Professor of Medical Sociology. He is Director of Social Science Research Activities for the New York City Department of Health on leave from Cornell University where he is a Professor in the Department of Sociology and Anthropology. Dr. Magda G. Pendall resigned as Assistant Professor of Administrative Medicine on October 1, 1959.

Professor Clay is doing a study of possible candidates for admission to the seventeen university programs in hospital administration.

Dr. Elinson spent the summer in Puerto Rico on a study of career orientations and attitudes of Puerto Rican nurses and physicians as part of the larger study of medical care being conducted by the School for the Puerto Rican government. Dr. Suchman is collaborating with him on this study. With Professor George James, Dr. Suchman and Dr. Elinson are developing a book on Evaluation in Public Health under the sponsorship of the Russell Sage Foundation. Dr. Elinson also provided consultation in social science research methods to research activities in other parts of the Medical Center. Among these was collaboration with Dr. John Weber, Assistant Clinical Professor of Psychiatry, on a plan to classify and analyze characteristics of a decade of clinic patients seen over a ten year period as a basis for further research. He also serves on the Advisory Committee of the Columbia-Washington Heights Community Mental Health Project.

Professor Frank W. Van Dyke has devoted almost full time as Associate Director of the studies of non-profit prepayment plans being done for the State of New York. He also was Chairman of a subcommittee of the Community Council of New York to prepare for a conference on problems of the aged in this area and a member of the New York City Committee for the 1960 White House Conference on Children.

Dr. Milton C. Maloney, Research Associate, completed a large scale study of the medical care secured by a representative sample of a state medical society membership for themselves and their families as one of a series of studies of the quality of medical care financed by the United States Public Health Service. He has been a

senior staff member of the New York State Prepayment Study and currently is directing a series of studies of the epidemiology of cerebral palsy, mental retardation and related disorders. The latter studies are being done under contract with the National Institute of Neurological Diseases and Blindness also aided by a grant from the Association for the Aid of Crippled Children.

Division of Occupational Medicine

No major changes were made in the division's teaching programs for graduate students in the School. Dr. Melvin M. Udel, Research Associate, resigned effective February 28, 1959. He was replaced by Dr. Arthur C. Ladd in September. Dr. Morris B. Jacobs, an experienced industrial hygiene chemist who is currently in charge of the New York City Air Pollution Control Laboratory, joined the staff as Adjunct Associate Professor of Occupational Medicine in September, 1959. Mr. George M. Wilkening and Dr. Thomas P. Nevins received appointments as Lecturers.

A study of work performance of epileptics was completed and a final report prepared by Dr. Udel. A similar study on persons having various cerebrovascular disorders was initiated by Dr. Ladd in September, 1959. Funds for this study are available through a research grant from the Office of Vocational Rehabilitation of the United States Department of Health, Education and Welfare. This agency has also provided funds for a part-time editorial assistant to prepare a series of reports on fifteen years of experience at the Bellevue Hospital Cardiac Work Classification Unit which was founded by Professor Goldwater.

Laboratory studies on the absorption and excretion of mercury in man have been initiated. Subjects under study are employees in a mercury plant and patients in the Dental Clinic. The School of Dental and Oral Surgery has participated in studying the latter group. Financial assistance was received from Lakeside Laboratories and the United States Public Health Service. A study of cystine metabolism in relation to occupational poisoning has been started in collaboration with the Division of Industrial Hygiene of the New York State Department of Labor. This is also being financed by a grant from the United States Public Health Service.

Professor Goldwater was President of the American Academy of Occupational Medicine for the year 1959, and is serving as Chairman of a subcommittee of the Scientific Committee in planning the Thirteenth International Congress on Occupational Health to be held in New York in July, 1960. He received a citation for meritorious service from the President's Committee on Employment of the Physically Handicapped and from the New York State Governor's Committee on Employment of the Physically Handicapped.

Division of Parasitology

The Division of Parasitology not only gives formal courses for the medical students and public health students, but also cooperates with all of the clinical departments in residency training. The elective for fourth year medical students in "medicine in the tropics" is now in its tenth year. During the past year, three students spent the elective in the Firestone Plantations Company Hospital in Liberia and three at the Aluminum Company of America Hospital in Surinam. Funds to support this program and also our graduate education program are provided by the United States Public Health Service.

One doctor of philosophy, a doctor of public health and two master of science candidates specialized in parasitic diseases during the year. Two students from Pakistan specialized in medical entomology.

Professor Harold W. Brown lectured on Parasitic Diseases at the medical schools of Cornell University, Temple University, New York Medical College, and the University of Missouri. He also participated in the educational programs of the New Jersey State Veterinary Medical Association and the Missouri Academy of General Practice.

Dr. Mary Dunn and Dr. Brown are making a study of the effects of pregnancy on the pinworm burden of mice. Dr. E. Reber, Doctor of Public Health candidate, and Dr. Brown are studying the circumoval precipitin test as a diagnostic aid in schistosomiasis. These studies are supported by grants from the National Institutes of Health.

Professor Brown and Dr. Vincent Perna, Instructor in Pathology, completed their study of an overwhelming *Strongyloides* infection. Pro-

fessor Roger W. Williams continued his studies at the Bermuda Biological Station on the helminths and blood sucking arthropods of the area. This program is supported financially by the National Institutes of Health and the Child Frick Fund of Bermuda.

Professor Kathleen L. Hussey continued studies on a hyperparasite of larval trematodes at the University of Michigan Biological Station with the research group headed by Dr. W. W. Cort of the University of North Carolina.

Cooperative research with the New York City Tropical Diseases Diagnostic Service continues with Dr. Brown and Dr. Max M. Sterman studying the efficacy of the new anthelmintic dithiazanine against trichiuriasis. This is the first effective oral therapeutic agent that has been developed against this persistent parasite. They also completed their clinical epidemiological study of *echinococcus* of man and dog in the same household in New York City.

At the request of President Duvalier of Haiti, Dr. Brown made a survey of their medical school and teaching hospital. He also participated in conferences on medical education and medical care in Taiwan, Africa and South America. Dr. Brown continued to serve as President of the New York State Board of Medical Examiners. He was elected President of the American Society of Parasitologists.

Dr. Williams serves as a member of the corporation of the Bermuda Biological Station for Research. He served as consultant and made a survey of biting insects of St. Johns Island for the Virgin Islands Government and the Rockefeller group.

During a sabbatical leave, Dr. Hussey studied larval trematodes at the Marine Biological Laboratory, Woods Hole, Massachusetts, the Department of Biological Sciences, Florida State University, Tallahassee, Florida and the Department of Microbiology, School of Medicine, Louisiana State University at New Orleans.

Division of Public Health Education

Professor George Rosen is a participant in the study of medical care for the Puerto Rican Government. He continued as Director of the American Public Health Association project on Social Science and Public Health with Dr. Wellin as

Field Director. Another study has been undertaken with the Health Information Foundation to determine what areas of the health field might be appropriate for further social science research. Professor Rosen has also started work on a sociology of medicine and is conducting a five year research study on the social history of mental illnesses under a grant from the National Institutes of Mental Health.

During the period covered by this report, Dr. Rosen accepted appointments as Special Consultant with the National Institutes of Health and as Consultant to Columbia University Press. He was appointed to membership on the Committee on Health Education of the National Health Council and the Committee on Vital Statistics Monographs, 1960 Census, Statistics Section of the American Public Health Association. He continued as Editor of the American Journal of Public Health, as Consultant in Health Education to the Professional Examination Service of the American Public Health Association and as a member of the Medical Advisory Board of the Sidney Hillman Health Center. He completed work and made a report as chairman of a committee to survey the Library of the New York Academy of Medicine.

Dr. Rosen has participated in seminars and served as a guest lecturer on historical subjects related to public health at several schools, including Temple University, Albert Einstein School of Medicine, the Schools of Public Health of Harvard and the University of Pittsburgh, and the University of London.

Division of Public Health Practice

Professor Margaret W. Barnard assumed administrative responsibility for the division in February, 1959, after the resignation of Dr. William C. Spring, Jr., DeLamar Professor of Public Health Practice. A committee consisting of Professors Barnard, George James and George Rosen was given the assignment of organizing the basic course in public health practice.

Dr. William C. Spring, Jr., received the appointment of Lecturer after resigning from his full-time position as DeLamar Professor of Public Health. Dr. Donald Dickson and Dr. Jack Goldman were appointed Lecturers. Mr. William C. Thomas, Jr., a political scientist who previ-

ously taught in the School on a part-time basis received the appointment of Instructor in Public Health Practice. Miss Gloria Dammann, Assistant Professor of Public Health Nursing, has been participating in the teaching of this division as a regular faculty member since September, 1959.

Dr. Barnard has continued on a part-time basis in the position of Public Health Administrator of the Columbia-Washington Heights Community Mental Health Project. She participated as a member of the New York City Regional Meeting of the New York State Committee for the 1960 White House Conference on Children and Youth (Section on Physical and Mental Health). She is Second Vice-President and a member of the Executive Committee of the New York Tuberculosis and Health Association. Organizational work is still going forward for the Upper West Manhattan Neighborhoods Association with Dr. Barnard as a member of the Executive Committee of the Board. She has recently been appointed a member of the Borough President's Planning Board Number 12 (Manhattan), a group concerned with civic matters relevant to the area from 155th Street north to the upper end of Manhattan.

Division of Sanitary Science

Professor Alvin R. Jacobson participated in several teaching programs in the Medical Center in addition to the basic public health program of this School. He completed a study of air pollution at the National Institutes of Health of the United States Public Health Service at Bethesda, Maryland. At the present time the reconstruction necessary to alleviate the problem is being undertaken according to his recommendations.

He has continued to serve on the Executive Committee of the Mid-Atlantic State Section of the Air Pollution Control Association and was a member of its Program Committee. He has also continued his authorship of two monthly columns for *Public Works* magazine.

The Institute of Nutrition Sciences

The Institute of Nutrition Sciences admitted its first students in September, 1958, and, although hampered by lack of proper space and facilities, has continued to expand its curricula for graduate students to help meet the world-

wide need for people equipped with the necessary knowledge to prevent malnutrition.

A sequence of work was initiated in September, 1959, to permit physicians to earn both the Master of Science in Nutrition and the Master of Public Health degrees in seventeen months. This includes study under the direction of Professor Nevin S. Scrimshaw at the Institute of Nutrition of Central America and Panama in Guatemala during the summer. Special arrangements have been made with St. Luke's Hospital for the training of dieticians in the nutrition sciences and public health while they are engaging in part-time work at the hospital. This is a two-year program leading to the Master of Science in Nutrition. Through the cooperation of Dr. Theodore B. Van Itallie, Associate Clinical Professor of Medicine, St. Luke's Hospital also provides the facilities for metabolic and clinical teaching and for research for the doctoral candidates. Students have carried out summer field projects under the Institute's direction during 1958 and 1959, in Guatemala and Puerto Rico and in New York at St. Luke's Hospital and with the New York City Health Department. Those students presently enrolled in the Institute programs come from Belgium, Costa Rica, Guatemala, India, Mexico, the Philippines and Puerto Rico as well as the continental United States.

The Advisory Board, consisting of many well-qualified citizens under the honorary chairmanship of Herbert Hoover, held its first meeting in October, 1958, and has met several times since. Considerable time and effort of both the Board and the Director of the Institute, Professor William Henry Sebrell, Jr., have gone into exploring the possibilities of acquiring additional building space necessary to accommodate students and program envisaged for the Institute.

Additions to the staff since July, 1958, are Dr. Nevin S. Scrimshaw as Adjunct Professor of Nutrition and Dr. Arthur W. Thomas as a special Lecturer. Four new research associates and one research assistant are working in New York at St. Luke's Hospital or in Haiti, and the Belgian Congo.

Income for the Institute has been derived in the form of training grants, fellowships, research grants and general support. Major donors include the United States Public Health Service, the Nu-

trition Foundation, the Coca Cola Company, Merck and Co., and the Williams-Waterman Fund.

Professors Sebrell and Elmer L. Severinghaus and their associates completed a nutrition appraisal in Haiti in the Summer of 1959. This study provides background information necessary for instituting an effective nutrition program for the country. A further study on school children in Haiti is underway. Similar work was performed by Dr. Severinghaus last Summer in Puerto Rico.

Metabolic research was continued at St. Luke's Hospital in association with Dr. Van Itallie. This includes studies of the effect of synthetic glycerides on serum lipids in human subjects, and continuation of work on the effect of blocking agents on cholesterol metabolism, and on the effect of lipemia on the components of the blood coagulation process.

Dr. Severinghaus taught for one term in the University of Indonesia Medical School at Djakarta and observed nutritional conditions in Japan and the Philippines during the period July 15 to December 1, 1959. During the fall, Dr. Sebrell has been visiting nutrition research centers in India to explore the possibilities of establishing working relationships between the Institute and Indian Universities and to make contacts with prospective students.

In the past eighteen months, Dr. Sebrell has continued as Chairman of the Committee on Protein Malnutrition of the Food and Nutrition Board of the National Research Council, as Vice Chairman of the United States National Committee of the International Union of Nutrition Sciences, as a member of the Expert Advisory Panel on Nutrition of the World Health Organization, as a member of the Council of the Society of Experimental Biology and Medicine, and as a member of the Scientific Advisory Committee of the Nutrition Foundation. Dr. Sebrell has also continued to serve as a member of the Standing Committee on Research Policy of the American Public Health Association and as Chairman of the Association's Editorial Subcommittee which has developed a Handbook on Nutrition now ready to go to press. He has continued as Vice Chairman of the Council on Research of the American College of Preventive Medicine, as a member of the Technical Advisory Committee of

the Institute of Nutrition of Central America and Panama and as a Consultant in Nutrition to the United Nations Children's Fund. He serves in this latter function also at St. Luke's Hospital. He is a member of the University International Relations Committee. He is President of the American Board of Nutrition and Chairman of the Program Committee of the Fifth International Congress on Nutrition to be held in Washington, D. C. in September, 1960. Dr. Severinghaus is Chairman of the Finance Committee for the Congress. Dr. Sebrell is also Chairman of the Forum Planning Committee of the National Health Council and a member of the Editorial Advisory Board of the American Academy of General Practice.

Continuation Education

Eight short-term Institutes lasting two to five days were held in the past eighteen months. There was in addition a course for voluntary agency personnel, given under the Continuation Education Program by Professor George Rosen. In all a total of 375 people representing medical, nursing, sanitary engineering and administrative disciplines attended the eight Institutes.

The third group of hospital administrators to enroll in the year-long basic hospital administration course began their studies in June, 1959. Thirty administrators of small hospitals from eighteen states, Panama, West Germany and

Iran made up the group. During the same month the second class to complete this course concluded its year of study with twenty-seven of the original thirty students spending two weeks on campus. Evidence of the effectiveness of the basic hospital administration course has begun to appear. Of the group of thirty-one hospitals represented in the first class, fourteen have now been fully accredited by the Joint Commission on Accreditation of Hospitals.

Assistance in the form of materials, discussions, or consultations was given to Edinburgh University, Scotland; University of Lisbon, Portugal; Staff College, London, England; University of New South Wales, Australia; University of California; University of Michigan; University of Pittsburgh; University of Georgia and Colby College, Waterville, Maine.

The program again arranged a short-term Institute for Physicians in Industry which was held in February, 1959, with approximately thirty physicians participating in courses in biostatistics, epidemiology, toxicology, ionizing radiation, principles of administration, and health programs under collective bargaining.

Professor Baumgarten, in addition to serving as Director of this program, has also been a senior staff member of two major research projects in the School, the medical care study for the government of Puerto Rico and the New York State Prepayment Study.

Radiology

WILLIAM B. SEAMAN, *Professor and Chairman of the Department
Director of Service*

The total number of radiographic examinations performed by the professional personnel of the Radiology Department has increased very little during the past few years. Such figures, however, do not reflect the strain exerted on our physical facilities and professional staff by the continually rising demand of time-consuming special procedures. This is a reflection of the increasing complexity of modern medical techniques. The recent completion of two cine-radiographic installations is another manifestation of this trend.

Work directed towards reducing patient radiation exposure incurred during diagnostic examinations is continuing and has resulted in great reductions in this exposure, without interfering with the production of optimum films. The improvement in film processing made possible by the installation of a second X-Omat and the recent acquisition of two image intensification tubes represent important additional steps towards the achievement of this goal.

The need for physical consolidation of the radiotherapy division is becoming increasingly apparent to permit improved methods of patient care and more efficient utilization of equipment and personnel.

Staff Changes

Dr. Morton M. Kligerman resigned to become Professor of Radiology and Chairman of the Department of Radiology of Yale University School of Medicine. Dr. David H. Baker joined our staff as an Assistant Professor of Radiology and Assistant Attending Radiologist on September 1, 1959, so that his presence for several months prior to the retirement of Professor John Caffey in July, 1960, will facilitate this change without impairing the work of the department. Dr. Harold L. Atkins, Instructor in Radiology and Assistant Radiologist, joined the radiotherapy staff in April. Dr. J. Luther Jarvis resigned to enter the private practice of radiology in North Carolina. Dr. F. Mitchell Cummins resigned to go into

private practice in New York City. Dr. Alexander D. Crosett, Jr., Dr. William J. Esposito and Dr. Spinks H. Marsh resigned to enter private practice. Dr. Robert P. T. Reeves, Instructor in Radiology and Assistant Radiologist, is another new member of our staff and is working in the Harkness Diagnostic Division. Dr. Preston L. Leslie joined our staff in September as an Instructor in Radiology and Assistant Radiologist. Dr. Robert A. Evans resigned to take a position at Stanford University, Palo Alto, California. Dr. Leonard C. Doubleday resigned to enter private practice. Dr. Norman E. Chase completed his residency and became an Instructor in Radiology and Assistant Radiologist on our staff. Dr. A. Gregory Jameson, Assistant Professor of Pediatrics and Assistant Attending Radiologist, began his duties as director of the cardiac catheterization section of the new diagnostic angiocardiology suite.

The following new Residents began their duties: Dr. Sylvan H. Sarasohn, Dr. Hugh G. Gregg, Dr. Edward D. Fram, Dr. Richard J. Fleming, Dr. Jose T. Medina, Dr. Alvan G. Renthal, and Dr. Theodore Robinson. Drs. Charles DiLiberti, Robert J. Johnson, Robert F. Kiley, and Robert S. Malcolm, Jr. completed their training.

New Equipment

The long awaited angiocardigraphic catheterization suite was completed in September of 1959. This room contains bi-plane Schonander film changing mechanisms capable of changing cut film at rates of six per second. The use of a Dynapulse permits exposures as short as one-thousandth of a second. This equipment also includes an eight inch image intensification tube and a 16 mm camera that can take cine-radiographs at speeds up to 60 frames per second. It is hoped that this will not only result in improved patient care but will also permit many important clinical physiological observations.

This suite also includes a laboratory equipped for blood gas analyses.

The old angiographic suite on the third floor stem of Presbyterian Hospital has been converted into a cine-radiographic room with the aid of a research grant obtained by Dr. Edmund N. Goodman, Assistant Clinical Professor of Surgery and Assistant Attending Surgeon, and Dr. Henry Colcher, Associate in Medicine and Assistant Physician, and the purchase of a new table by the hospital. This will be used for combined electrogastrographic and cine-radiographic studies of the stomach and esophagus and permit the development of cine-techniques for routine gastrointestinal radiology.

There has been considerable revision and modernization in Harkness Pavilion. Early in the year there was general redecorating and refurnishing of the waiting room, as well as creation of a new waiting area for inpatients. An X-Omat was installed during the summer and the resulting saving of space permitted the acquisition of an extra radiographic room and additional space for waiting rooms and closets. This has increased the overall efficiency of this department especially in fluoroscopic work as patients can now wait near the fluoroscopic rooms.

In the Neurological Institute a new Schonander head unit was installed and a new fluoroscopic table was installed in one of the myelographic rooms. A special new rotating table for pneumoencephalography designed by Professor Juan M. Taveras was constructed and is now in daily use. Plans have been made for a new department of neuro-radiology on the ground floor of Neurological Institute.

Research and Clinical Activities

Professor Norah duV. Tapley, Dr. Cyril Sanger, Associate in Anesthesiology and Assistant Attending Anesthesiologist, Professor Harold W. Jacox and Professor William B. Seaman were the recipients of a research grant from the Department of Health, Education and Welfare, United States Public Health Service, National Institutes of Health for clinical studies of the effects of increased oxygen pressure on radiosensitivity of cancer. This clinical technique which was originally done at St. Thomas' Hospital in London, England, where Dr. Sanger was a mem-

ber of the research group, consists of treating patients while they are immersed in a tank containing 100% oxygen under three to four atmospheres of pressure. The early results obtained by the English group have been very promising and it is felt that an extensive clinical study in this country is also warranted. The oxygen tank has been designed and constructed and was delivered during the latter part of December.

The department was also fortunate to obtain a training grant from the United States Public Health Service to permit the organization of a training program in neuro-radiology under the direction of Dr. Taveras. It is planned to accept two candidates a year, who have completed a radiologic residency, for two years of advanced training in neuro-radiology and allied sciences. This should result in an increase of research activities in this area, as well as enhanced patient care and teaching.

A postgraduate course in neuro-radiology was given for the first time and attended by more than one hundred physicians. The course was directed by Dr. Taveras with the assistance of many others from the Departments of Radiology, Neurological Surgery and Neurology.

Dr. Jacox continued as Associate Editor of the Journal of Radiology and as co-editor with Dr. Kligerman of the Radiation Therapy Section of the Year Book of Radiology. Dr. Jacox and Dr. Seaman are representatives to the American Standards Association for the Radiological Society of North America and the American Roentgen Ray Society, respectively. Dr. Jacox became a Founding Member of the American Club of Radiotherapists. He has written a chapter on radiation therapy for a book on lung tumors. He continues to study the effects of radiation on normal and abnormal tissues.

Professor Kent Ellis and Dr. Robert Hochstim reviewed the osseous changes in osteomalacia associated with the malabsorption syndrome. They have just finished a study on the effects of hyperparathyroidism on the bony skeleton. Dr. Ellis and Dr. Jerome Nadelhaft studied the heart size in normal newborn babies. Dr. Ellis in collaboration with Dr. Beverly C. Morgan, Assistant in Pediatrics and Assistant Pediatrician, is investigating the roentgen findings in transposition of the great vessels.

Dr. Ralph Schlaeger has been studying the physiology of postoperative stomach in conjunction with Dr. Edmund N. Goodman, Assistant Clinical Professor of Surgery and Assistant Attending Surgeon, and Dr. Harold D. Harvey, Professor Emeritus of Clinical Surgery and Consultant, and Dr. Henry Colcher, Associate in Medicine and Assistant Physician. He is also studying the problem antrum and attempting to correlate radiologic and electrogastrographic findings. Dr. Schlaeger and Dr. Paul Wermer, Associate in Medicine and Assistant Attending Physician, reviewed the gastrointestinal alterations in adenomatosis of the endocrine glands and presented this work at the meeting of the Radiological Society of North America. During the past year, a new technique for operative cholangiography was introduced, which included the design and development of a new type of film tunnel.

Professor Gerhart S. Schwarz is continuing to develop the XVS system of radiographic exposures. He presented this material at the IX International Congress of Radiology in Munich. Dr. Schwarz is also writing a monograph on this subject. He and Dr. David V. Habif, Associate Professor of Clinical Surgery and Associate Attending Surgeon, are studying the axillary veins by the means of roentgen venography before and after radical mastectomy in an attempt to determine the cause of arm edema. With Dr. Harold M. M. Tovell, Associate in Obstetrics and Gynecology and Assistant Obstetrician and Gynecologist, and Dr. D. Anthony D'Esopo, Professor of Clinical Obstetrics and Gynecology and Attending Obstetrician and Gynecologist, Dr. Schwarz is investigating the problem of stress incontinence in women. Dr. Schwarz and Professor Roberts Rugh have received a grant from the Cerebral Palsy Association for the investigation of electroencephalographic changes in rats following X-ray exposure. Dr. Schwarz also served as a member of the Subcommittee of the Commission on Education of the American College of Radiology for the development of an index system of roentgen diagnoses.

Dr. Seaman participated in the symposium on lung cancer sponsored by the American Cancer Society at Arden House. He and Dr. Jose T. Medina are developing a program for the study

of the larynx and hypopharynx by means of contrast roentgen visualization and correlation with the normal and abnormal anatomical findings. It is expected to continue this work using cine techniques.

Dr. Meyer Alpert has been studying the vascularity of bone tumors by means of arteriography. Ewing's sarcoma has been studied before and after radiotherapy. With Dr. Robert E. Carroll, Assistant Clinical Professor of Orthopedic Surgery and Assistant Attending Orthopedic Surgeon, he has been reviewing sarcoid of the hands, which will be presented at an orthopedic society meeting in the near future. Dr. Alpert continues to give a course in skeletal roentgenology to the orthopedic residents taking the basic science course.

Professor Josephine Wells and Dr. Charles M. Steer, Associate Clinical Professor of Clinical Obstetrics and Gynecology and Associate Attending Obstetrician and Gynecologist, have completed a survey of leukemia in children as related to pelvimetry in the mother and have found no difference in the percentage of mothers having pelvimetry among the leukemia cases as compared to the controls. This is in accord with several other recent studies completed in this country but is opposed to the findings of English workers. Dr. Wells is also conducting a survey of carcinoma of the stomach with Dr. Charles A. Flood, Associate Professor of Clinical Medicine and Associate Attending Physician, to determine whether the results are better in those cases which are difficult to diagnose radiographically. Preliminary studies indicate that this is probably true. Dr. Wells with Dr. Tapley has completed an article on a review of about 800 consecutive gastrointestinal series done on the ward and clinic services to evaluate the accuracy of diagnosis and the types of lesions found.

Dr. Donald W. Johnson, Associate in Radiology, and Dr. Hochstim are studying the radiographic changes in the colon following the prolonged use of cathartics. A comparative study of hypaque and renografin as used for intravenous pyelography is being conducted by Dr. Johnson and Dr. William D. Horrigan. Dr. Johnson is also collaborating with Dr. Martin F. Ill, Assistant Resident in Urology, on a review of presacral pneumograms in patients who have undergone

surgery in an attempt to estimate the value of the examination.

Dr. Melvin H. Becker and Dr. Caffey had an exhibit at the meeting of the Radiological Society of North America in Chicago on rhabdomyosarcoma in children.

Dr. Tapley, Assistant Professor of Radiology and Assistant Attending Radiologist, in association with Dr. Algernon B. Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist, Dr. George A. Hyman, Associate in Medicine and Assistant Physician and Dr. Robert M. Ellsworth, Assistant in Ophthalmology and Assistant Ophthalmologist, are continuing their study of the treatment of retinoblastoma with radiation alone and in combination with T.E.M. By using labeled T.E.M. they are attempting to determine the localization of T.E.M. within the tumor. Dr. Tapley, with Dr. Maurice Lenz, Professor Emeritus of Clinical Radiology and Consultant, and Dr. Daniel C. Baker, Jr., Clinical Professor of Otolaryngology and Attending Otolaryngologist, are reviewing all of the laryngeal cancers seen at Presbyterian Hospital since 1930.

Dr. Taveras is continuing to participate in a joint study which attempts to evaluate the effect of combining radiotherapy and chemicals of the atabrine group in the treatment of glioblastomas. Dr. Taveras and Dr. Edward B. Schlesinger, Assistant Professor of Clinical Neurological Surgery and Attending Neurological Surgeon, are continuing their studies of the localization of brain tumors by radioactive isotopes.

Francis Delafield Hospital

Diagnostic Division

Professor Arnold Bachman is continuing his studies on normal and abnormal swallowing mechanisms using a Fairchild camera. This investigation is being continued with respect to abnormalities of swallowing in patients who have had radical surgery in the laryngo-pharyngeal region. Dr. Bachman and Dr. Kevin Macken are continuing their investigation of the azygous vein in patients with tumors and other abnormalities involving the mediastinum. A preliminary report covering more than sixty cases is being prepared for publication and exhibition at a national medical society meeting in the near future.

This work is being done in conjunction with Dr. Wolfgang Ackermann, Assistant Visiting Surgeon, Delafield Hospital. Dr. Macken with Dr. Elliott F. Osserman, Assistant Professor of Medicine and Assistant Physician, is investigating the osteoblastic bone changes and reactions occurring in multiple myeloma. Dr. Bachman gave a refresher course at the meeting of the Radiological Society of North America. There have been no major changes in either the personnel or the equipment of the Department of Radiology at Delafield Hospital during the past year.

Therapeutic Radiology

Professor Ruth J. Guttman noted that during the past year they have had the largest patient volume in the history of the hospital. The clinical division of the Isotope Department is being expanded to include blood volume determination using iodinated human serum albumin and the Schilling Test for the diagnosis of pernicious anemia. The studies initiated in the past concerning the effects of supervoltage radiation on different malignant lesions are continuing since it requires large numbers of patients carefully followed for a number of years before it is possible to draw any conclusions. A new project is the clinical use of a scintillation counter and recorder using a Thulium 170 source. This counter has been developed by Mr. Carl B. Braestrup, Associate in Radiology, in the Physics Department of Francis Delafield Hospital, and is now being used on patients. It is hoped that it will be able to demonstrate the effect of different dosages of radiation in bone metastases during therapy. Dr. Guttman attended the IX International Congress of Radiology in Munich and presented a paper on the treatment of inoperable carcinoma of the lung with supervoltage therapy.

Physics

The first part of a research project concerned with the development of instruments and procedures for the more accurate evaluation of the cumulative occupational dose in radiology was completed with the support of an Atomic Energy Commission grant. The results were presented at the IX International Congress of Radiology in Munich by Mr. Carl B. Braestrup. Mr. Braestrup also completed the study of radiation emit-

ted by electronic tubes operating in the voltage range of 15 to 25 kv. This included consideration of possible somatic damage associated with the operation of cathode ray tubes, electron microscopes and television tubes. In addition, the average gonadal dose for the whole population from home television sets was evaluated.

The investigation concerning the clinical usefulness of previously developed transmission scanning system was continued. The apparatus was constructed for the quantitative analysis of density changes due to tumor growth or shrinkage. A Thulium 170 source provides sufficiently low energy gamma radiation to give satisfactory contrast between bone and soft tissue. The primary objective is to measure the changes in the bone structure as may be produced by neoplastic disease. Application has been made and granted allowing the use of the automatic transmission scanning device on patients.

Radiological Research Laboratory

The activities of the Radiological Research Laboratory have been divided between a research project for the Atomic Energy Commission and a program including teaching and the medical uses of isotopes.

The research project for the Atomic Energy Commission operates under a contract between Columbia University and the Atomic Energy Commission and is under the direction of Professor Gioacchino Failla. Research is conducted in two general fields: radiological physics and radiobiology.

The work in radiological physics is largely confined to dosimetric problems involving the measurement of absorbed dose of any type of ionizing radiation under a variety of exposure conditions encountered in practice and to the determination of quantities related to dosimetry. Radiobiology under the Atomic Energy Commission contract deals largely with the effects of ionizing radiation on mammals. Below is a brief summary of the activities.

Dr. Failla, Dr. William Gross, Research Scientist, and Associates

A method to compare directly the absorbed dose (in rads) in various "tissue" compositions with the X-ray exposure dose (in roentgens) has

been developed. This is accomplished by measuring the ionization produced in a parallel plate standard chamber filled with a "tissue" equivalent gas or air. The main purpose of this work is to develop tissue equivalent ionization chambers for practical dosimetry in radiology and radiobiology when low voltage X-rays are used.

In the preparation of tissue equivalent plastics it is necessary to make certain approximations for practical reasons. In general this involves the introduction into the plastic of an element not present in the material it is intended to simulate. In order to check the equivalence of such mixtures, the ionization in an air equivalent gas (containing predetermined proportions of H, C, N, D and Si) was compared with the ionization in atmospheric air, under suitable conditions. It was found that the ionization ratios for X-rays of different energies (30 to 210 kv with suitable filters) are independent of X-ray quality, within the experimental error.

At the present time, it is of great interest to correlate the radiation dose in bone with the incidence of radiation induced bone tumors. Similarly, it is of interest to correlate the bone marrow dose with the incidence of radiation induced leukemia of bone marrow origin. This applies to beta ray emitters, such as strontium-90, within the bones and also to gamma radiation from external sources passing through bone and marrow. The dosimetry problems involved are very complex. As a start we have compared the absorbed dose in bone to the exposure dose (in roentgens) with four different qualities of X-rays (30 to 210 kv). The relative experimental values are in excellent agreement with those theoretically predicted. The problem of the variation of absorbed dose in the neighborhood of the interface between bone and soft tissue is being investigated by means of a parallel plate extrapolation ionization chamber. One wall is of bone equivalent plastic and the other of muscle equivalent plastic. The gas in which the ionization is measured, is either bone or muscle equivalent in order to study the dose distribution in their layers on either side of the interface.

The Department of Urology is interested in the use of balloon catheters permanently coated with radioactive silver-111. We have developed and tested a suitable method for determining the

surface and depth doses in tissue in contact with the balloon.

An investigation of some effects of X-rays on rotifers, pond-dwelling metazoans, has been carried out. Rotifers lay eggs that develop parthenogenetically and hatch in about twenty-four hours. After hatching, no further cell division takes place. A group of rotifers were irradiated with 50,000 r of X-rays at one day of age. These animals (and appropriate controls) were followed for survival time, egg production and egg hatchability, as were a number of generations derived from them. No effects were seen in the irradiated animals themselves. Their early descendants, however, showed reduced life spans and decreased fertility. By the thirteenth post-irradiation generation, the egg production and egg hatchability were still only about eighty per cent of control values while the survival time had returned to normal by about the third generation after irradiation. This shows the great radio-resistance of non-dividing cells and the persistence of genetic damage through many generations.

A large scale experiment has been started to determine the spontaneous mutation rate and the lifespan of *Drosophila melanogaster* at two different temperatures (17° and 27° C). The results will be of interest in connection with the theory that the lifespan is essentially determined by the spontaneous mutation rate.

Dr. Roberts Rugh, Associate Professor of Radiology, and associates

The following radiobiological problems are under investigation:

1. X-irradiation exencephaly. Congenital cerebral hernias, known as exencephalies, have been produced by x-irradiation of the mouse embryo at any time prior to the first cleavage of the fertilized egg (within 12 hours of conception through 9.0 days of gestation.)

2. Cytochemical study of the human testis exposed to 1200 r X-rays. This study was supported by a grant from the National Institutes of Health.

3. Fetal conditioning to tumor acceptance. Mice (CF₁) which are known to be resistant to adenocarcinomas which normally grow in C57 black mice, are being exposed while in utero to implants of the tumor into the pregnant mouse to

determine whether such exposure subsequently alters the ability of such mice to accept transplants of this tumor.

4. The normality of litter mates of congenital anomalies produced by embryonic or fetal x-irradiation. Over 12,000 mouse fetuses have been examined to determine the age of exposure and dose level of X-rays which will produce congenital anomalies, particularly cerebral hernias (exencephalies). While there are always apparently normal litter mates, but ones which are stunted, these are being examined thoroughly to determine what other systems besides the C.N.S. may be affected by x-irradiation of the embryo.

5. The onset of heterosis. It is known that when pure strains of animals are crossed, the resultant hybrids are more resistant to x-irradiation death than are either of the parental strains. It is of interest to determine when in embryonic or fetal life this increased radioresistance is first evident.

In addition to the above problems, Dr. Rugh is investigating the effect on the brain of x-irradiation of the fetus as determined by the electroencephalogram. This work is supported by a grant from the United Cerebral Palsy Research and Educational Foundation. He also has a grant from the National Institutes of Health to study the effect of low level x-irradiation on sex differentiation and fertility and another grant to carry out a neuropathological study of congenital X-ray anomalies.

Dr. Harald H. Rossi, Associate Professor of Radiology, Mr. Walter Rosenzweig, Research Scientist, Dr. Ruth Hill, Research Scientist, and Associates.

A cooperative study with members of the Medical Department of the Brookhaven National Laboratory is being continued with the object of determining the relative biological effectiveness of fast neutrons as a function of their energy. The ultimate purpose of this work is to obtain information on the dependence of biological effect on linear energy transfer of ionizing radiations. Extensive measurements have been carried out to determine the dose received by the mice irradiated. In order to attain adequate precision, new types of chambers had to be designed, constructed and tested. These chambers contain a

minimum amount of material and are used to determine both the characteristics of the radiation field before introduction of the mice and the dose distribution inside the mice.

A new system has been developed for the measurement of RBE dose in the environs of accelerators where personnel may be exposed to significant amounts of both neutrons and gamma-rays. The apparatus has been designed and is now being constructed.

The spherical proportional counter continues to be utilized for the procurement of information on the LET distribution of absorbed dose. In addition studies are performed to elucidate the detailed techniques of energy deposited by charged particles in irradiated tissues. This work is now being extended to include electromagnetic radiations.

Considerable progress has been made in the research on statistical fluctuations of energy loss of charged particles and the thesis resulting from this work will be submitted to the Physics Department of Columbia University in the near future.

Studies on the biological effects of ultra-violet and X-rays are carried out with particular emphasis on radiation genetics in bacteria. Mutants exhibiting increased radiation sensitivity have been isolated and the radiobiological properties of these mutants have been compared with those of the wild type and known radiation resistant mutants. These strains do not differ in their "nuclear multiplicity" or in their contents of DNA and RNA. Investigations are planned of the possibilities of genetic recombination between these bacterial strains in an attempt to discover whether radiation sensitivity is a property of a single locus or more than one. A cooperative project has been initiated with Dr. S. A. Ellison, Assistant Professor of Microbiology, to investigate the behavior of radiation sensitive mutants as hosts for the propagation of bacteriophage.

As in previous years, considerable assistance has been given to other institutions in the training of their personnel who intend to employ dosimetric techniques developed at this laboratory. Two such fellows are visiting this laboratory from England and from Japan.

Dr. Rossi, Mr. Francis DeFriess, and associates

As in the past most of the efforts of this group

have been concerned with routine work, including treatment planning, resident training and related subjects. Because of increasing interest in patient exposure, a good deal more work was devoted to determining the dose received in individual cases of diagnostic exposure. One special study consisted in the estimation of the fetal gonadal exposure in pelvimetry comparing Ball and Caldwell-Mollay methods.

Further work has been carried out on the problem of adopting cadmium sulfide crystals for intracavitary dose measurements with particular attention given to methods whereby the speed of response may be increased.

In order to obtain further information on the characteristics of the radiation to which diagnostic patients are exposed, a scintillation spectrometer has been constructed and a long-term study has been initiated in which the spectral characteristics of diagnostic X-radiation will be irradiated tissue.

A water phantom has been constructed containing inserts providing both air cavities and wedges of bone equivalent plastic. This phantom is to be used in the evaluation of radiographic techniques.

Radioisotope Laboratory

The Radioisotope Laboratory, under the direction of Professor Edith H. Quimby, Professor of Radiology, continues to receive and standardize all radioactive isotopes of iodine, phosphorus, gold and sodium, and occasional other shipments, and dispense them to clinical and research departments. During the calendar year 1959 the following isotope materials were processed:

<i>Isotope</i>	<i>No. of Shipments</i>	<i>Total Millicuries (Approximate)</i>
Iodine-131		
For cancer	20	2000
For other uses	21	2100
Diiodotyrosine	1	1
Phosphorus-32	14	560
Gold-198	3	600
Sodium-24	35	797
Potassium-43	25	289
Co-60 (B-12)	3 (24 capsules)	12 microcuries

The iodine for non-cancer use was used in thyroid diagnostic studies and in therapy for Graves' disease and for certain cardiac conditions. In the routine diagnostic laboratory 1,281 (to November

30) uptake studies were done; in the research laboratory an additional fifty-eight tracer studies were made on adult patients presenting special problems, as well as twenty studies on children between three to eleven years of age. Three-hundred-three complete scintiscans were done (40 microcuries per dose). Twenty-two doses were prepared for blood chromatography, the procedure being carried out in Dr. Wermer's laboratory. One-hundred-six patients received one or more doses for treatment of hyperthyroidism.

In addition to doses for routine tracer or therapeutic purposes, 231 samples of iodine-131 were prepared for experimental uses in other departments.

Of the radioactive phosphorus, 159 millicuries were used in treatment of twenty-four patients with leukemia or polycythemia and 6 millicuries were used for twelve diagnostic eye tests. The remainder (61 millicuries) was distributed to various authorized groups for research purposes, seventeen such samples being dispensed.

The radioactive gold was used in treatment of three patients having fluid effusions due to metastatic cancer; of these, one had pleural effusions and two, abdominal.

The radioactive sodium and potassium were all used for research by the five to eight members of the "sodium-potassium pool." Fifty-eight samples of sodium and twenty samples of potassium were prepared.

The broad license continues to be administered by the Joint Radioisotope Committee of the Medical Center. Dr. Failla is chairman of this committee; Dr. Quimby is also a member. About 180 applications (including requisitions) have been received and reviewed during the past year. Both regular diagnostic and therapeutic services and special cooperation with other groups on research projects continue. All members of the staff are frequently consulted on such projects.

Teaching and other activities of staff members

Members of the laboratory staff carry on various teaching activities. Dr. Failla and Dr. Quimby continue to be members of the Subcommittee on Graduate Instruction for Work in Biophysics. Instruction particularly for students in this field

is offered by Drs. Failla, Quimby, Rugh, and Rossi. A course leading to a master's degree in radiologic physics is now being given. It has four students. Instruction is offered by Drs. Rossi, Quimby, Feitelberg, Gross, Rugh, Seaman, Tapley and Mr. Braestrup with the cooperation of members of the staff of the Radiological Research Laboratory.

The course in clinical use of radioactive isotopes under the joint leadership of Professors Quimby and Feitelberg, and with the cooperation of several guest lecturers, continues to be offered twice yearly. In 1959, the enrollment in the two courses was sixty-eight.

Dr. Quimby's course in radiologic physics offered in the Spring term for Residents in radiology at hospitals throughout the city and its environs continues to be well attended. In 1958, there were eighty-five registrants. She has also given a considerable number of invited lectures to medical and lay audiences.

Dr. Quimby attended the VI Inter-American Congress of Radiology in Lima, Peru in November, 1958, where she presented two papers as part of a symposium on radiation hazards, and gave a refresher course on radioactive isotopes. She then spent three weeks in Brazil, divided between the Universities of Rio de Janeiro and Sao Paulo, where she gave two series of lectures on radiation dosimetry. This program was arranged by CAPES (Commissao de Aperfeicoamentos de Pessos de Ensino Superior).

Dr. Quimby, with Drs. Feitelberg and Silver, prepared the textbook for the radioisotope course, "Radioactive Isotopes in Clinical Practice," which was published by Lea and Febiger in late 1958. It has been so widely used that two new printings have already been necessary. She has also recently completed a book on "Safe Handling of Radioactive Isotopes in Medical Practice," which will be published in 1960.

Dr. Failla has continued to be active in work with the Atomic Energy Commission and other government agencies, both civilian and military, on problems related to atomic energy. He is consultant to several of the Atomic Energy Commission installations and is a member of the Review Committee for the Division of Radiological Physics and the Division of Biological and Medical Research of the Argonne National Laboratory.

He is also Chairman of the Radiation Instrument Panel of the Defense Atomic Support Agency and Vice Chairman Emeritus of the International Commission on Radiological Protection. He is also a member of the Genetics Committee of the National Academy of Sciences, a member of the Advisory Panel on Medical Sciences of the Department of Defense, a member of the Scientific Advisory Board of the Walter Reed Army Medical Center and a member of the Committee on Units, Standards and Protection of the American College of Radiology.

Dr. Failla attended the meeting of the IX International Congress of Radiology in Munich and meetings of the International Commission on Radiological Protection and the International Commission on Radiological Units immediately preceding the Congress. He was one of the Vice Presidents Emeriti of the Congress and presented a paper by invitation at the meeting.

Dr. Rossi also presented a paper by invitation at the IX International Congress of Radiology in Munich and attended meetings of the International Commission on Radiological Units. He was elected a member of this Commission and continues as Chairman of Committee III C, Vice-Chairman of Committee III and as a member of an Ad Hoc Committee on Radiation Quantities and Units. He is a member of the International Committee on Radiation Protection, Chairman of Subcommittee IV of this body and also a member of its Subcommittee M-3. He is a member of the Technical Committee on Ionizing Radiation of the Mayor of the City of New York and a member of Subcommittee N 2.4 of the American Standards Association.

Dr. Rugh also attended the IX International Congress of Radiology in Munich where he presented a paper and an exhibit. This exhibit was

awarded (jointly with four others from four countries) first prize for the best scientific exhibit at the Congress. The exhibit consisted of a series of enlarged photographs of embryonic congenital anomalies caused by relatively low doses of X-rays. The prize was awarded by the German Roentgen Society as part of the Congress.

Dr. Rugh was awarded the Major Louis Livingston Seaman Prize of the Association of Military Surgeons for his paper entitled: "Ionizing radiations — their possible relation to the etiology of some congenital anomalies and human disorders," published in *Military Medicine*, June, 1958.

Statistics of Radiological Service — 1959

The annual statistics for both the diagnostic and therapy divisions of the Radiology Department and comparison with the previous year are presented in the tables below. The figures for Presbyterian Hospital and Harkness Pavilion include 305 patients who were given 4,227 treatments on the betatron. This represents an increase of seventy-six patients as compared to 1958, but a decrease of nine treatments. This partially reflects an experimental program of doing palliative therapy in selected patients in a few intensive treatments in comparison to the conventional lengthy protraction. Of the total of 1,220 patients treated with X-ray therapy, 1,076 were treated for malignant disease and only 144 received therapy for benign conditions.

The slight increase in the total number of diagnostic examinations from 125,979 (excluding chest survey examinations) in 1958 to 127,705 in 1959, does not accurately reflect the increased work of the department since much of the increased demand has been for complicated, time-consuming special procedures.

DIAGNOSTIC DIVISION:

	1959		1958	
	<i>Patient Visits</i>	<i>Examinations</i>	<i>Patient Visits</i>	<i>Examinations</i>
Presbyterian Hospital	55,524	63,690	53,610	61,868
Harkness Pavilion	25,634	32,119	25,936	31,229
Neurological Institute	6,937	11,579	7,722	11,946
Urology	5,532	5,632	5,017	5,336
Ophthalmology	709	1,230	715	1,164
Babies Hospital	10,504	13,455	10,384	14,436
Chest Survey	14,373	14,373	13,629	13,629
	<u>119,213</u>	<u>142,078</u>	<u>117,013</u>	<u>139,608</u>

RADIOTHERAPY DIVISION:

	1959		1958	
	<i>Treatments</i>	<i>Patients</i>	<i>Treatments</i>	<i>Patients</i>
Presbyterian Hospital	6,577	521	5,290	406
Harkness Pavilion	4,907	464	7,624	526
Neurological Institute	5,090	211	3,485	195
Ophthalmology	302	39	518	63
Radium	70	65	48	48
Isotopes	133	133	173	173
	<u>17,079</u>	<u>1,433</u>	<u>17,138</u>	<u>1,411</u>

Surgery

GEORGE H. HUMPHREYS II, *Mott Professor and Chairman of the Department
Director of Service*

In accordance with the decision of the Joint Administrative Committee of the Columbia-Presbyterian Medical Center, this report covers for the first time all of the activities of the Department of Surgery in the College of Physicians and Surgeons, in the Presbyterian Hospital and in the seven other affiliated hospitals. Because the most recent previous report of its college activities was given in the report of the Dean for the academic year 1957-58, this report includes the eighteen month period from July 1, 1958 to December 31, 1959. In this period there have been no major changes in organization of the department, nor in the character of approach to its triple purpose of teaching, research and patient care. It is difficult, however, to compress its manifold activities into this condensed account, without omitting much of importance that deserves fuller exposition.

The Department lost two members through death, two members reached retirement age and three resigned to accept academic posts of higher responsibility. Five younger men, all graduates of our own residency training programs, were added. In the undergraduate curriculum, a searching reappraisal has been begun but no changes have yet resulted.

The Presbyterian Hospital residency training program continues its successful integration with the programs at the Francis Delafield, Bellevue and Mary Imogene Bassett Hospitals. This program continues to attract men of the highest calibre and to graduate a majority who continue in a teaching career both here and at other institutions. Clinical activity remains at the capacity of our facilities at the Presbyterian Hospital, and has increased in the affiliated hospitals, where expanded facilities have made it possible.

Research in the major fields of cancer, cardiovascular and metabolic diseases, and in the related disciplines of pathology, physiology and bacteriology, as applied to surgical problems, continues at a high level, limited principally by

available laboratory space. The productivity of the department, as indicated by papers read and published and extramural activities of the staff, continues to indicate a satisfactory vigor.

Staff Changes

On April 18, 1959, the staff was shocked and saddened by the sudden death of Dr. David Chapman Bull. Although he officially had retired from active teaching on July 1, 1957, Dr. Bull maintained an active interest not only in his own practice, but also on the ward service to which he had given such loyal devotion for thirty-six years. Beginning as Chief of the Surgical Out-Patient Department in the old hospital in 1923, he continued as Chief of Surgery in the Vanderbilt Clinic during the first three transitional years after the Medical Center opened. His principle interest in the problems of peripheral vascular disease and blood transfusion continued to the end. A tireless worker and patient counselor with a wry humor all his own, we miss his sage advice.

On December 18, 1959, Professor Aaron Himmelstein died after a brief illness, only six months after he had taken over direction of the open heart program from Professor Ralph A. Deterling. He was forty-five years old. Following his graduation from Cornell Medical School in 1937, Dr. Himmelstein was trained on the First (Columbia) Division Surgical Service at Bellevue Hospital and on the Thoracic Surgical Service there. At this time he became associated with Drs. Andre Cournand and Dickinson W. Richards in their development of cardiac catheterization techniques, and continued his interest in the study of cardiopulmonary physiology in their laboratory at Bellevue as well as at the Medical Center up to his death. In 1947, following active duty in the Italian campaign during World War II, he returned as a member of the teaching staff at Bellevue and Presbyterian Hospitals. Three years later, he resigned from the Presbyterian to

work with Dr. Mark Ravitch at Mt. Sinai Hospital, but continued his work at Bellevue, as well as at the Kingsbridge Veterans' Hospital. In 1955, he returned to Presbyterian to work with Dr. Deterling on the open heart surgery program, with a special interest in the problems presented by infants with congenital lesions. On July 1, 1959, he was put in charge of the program.

In his own quiet way, Dr. Himmelstein was one of the most effective younger members of the department. His background of physiologic knowledge, his technical skill in both diagnostic methods and surgical management and broad human understanding of the problems of students, residents and patients gave promise of a fine career. That this was abruptly cut off just as it was entering a phase of maximum productivity seems particularly cruel. He will be sorely missed by all with whom he was associated.

Two other long term members of the staff retired. On July 1, 1958, Dr. Robert Grinnell ended thirty-seven faithful years of active teaching and ward service. From the beginning of his internship in 1921, Dr. Grinnell served the department continuously, interrupted only by a four-year period in the Presbyterian Hospital Unit during World War II. Professor Harold Dortic Harvey retired on July 1, 1959. A graduate of the College of Physicians and Surgeons in 1925, Dr. Harvey was one of the students whose interest in the critical study of wounds was stimulated by the socratic teaching of the late Professor William Clarke.

In the past eighteen months, three members have resigned. In November, 1958, Dr. Norman Thomson left, only ten months after being appointed to the staff following completion of his thoracic residency, in order to take charge of the open-heart surgery program at the Children's Hospital in Buffalo. On July 1, 1959, Professor Deterling resigned in order to accept the position of Professor of Surgery at Tufts University in Boston where he is also Surgeon-in-Chief of the New England Center and Tufts division of the Boston City Hospital. Dr. Deterling had been a member of the department since January, 1948. During this period he was a leader in our cardiovascular surgery program. On October 1, 1959, Dr. Julius Jacobson resigned to accept a position as Assistant Professor and Chief of the experi-

mental surgery laboratory at the University of Vermont.

On September 1, 1958, Dr. J. William Littler was appointed as Associate Clinical Professor of Surgery and Attending Surgeon. His appointment brings strength to our training program in plastic surgery. On July 1, 1959, Professor George Crikelair became Chief of the Plastic Surgery Division. Dr. James R. Malm was appointed as Instructor and Assistant Attending Surgeon on January 1, 1959, and was put in charge of the open heart surgery program. Dr. William Bernhard has accepted a position in the research laboratory of Dr. Robert Gross at the Children's Hospital in Boston. Thus all four of the Residents graduating in this training program in the past two years have gone on to academic positions of important responsibility.

Dr. Cadvan O. Griffiths was appointed Instructor and Assistant Attending Surgeon at Presbyterian Hospital and Assistant Visiting Surgeon at the Francis Delafield Hospital, as a new member of the Plastic Surgery Division. Dr. Sanford Weissman, research Fellow and Instructor in Surgery at the Delafield Hospital in association with Dr. Frederic P. Herter, was appointed an Assistant Attending Surgeon.

Teaching Program

The changes in curriculum in the first two years of the undergraduate medical school, which were begun in September, 1958, have as yet not been reflected in our teaching. Beyond a continued broadening of the basic concepts on which modern surgery rests, the introductory course in the second year remains unchanged. However, the recognition of need for review of objectives which resulted in these changes has resulted in a searching reappraisal of the clinical years at Faculty committee level.

It is recognized that in spite of added effectiveness of the small groups assigned to individual preceptors which was begun in 1957, the total teaching time in surgery in the third year is far too short to afford the student an adequate concept of this major subject. As a result, he too often comes to the clerkship in his fourth year inadequately prepared to take the clinical responsibility he should be given at this level. Added ward experience, under close guidance at Presby-

terian Hospital in the third year, would greatly enhance the effectiveness of the increasingly good, but more advanced clinical opportunities which are now being developed in the affiliated hospital clerkships in the fourth year. To reconcile this added need of teaching time without overcrowding the schedule, or detracting from other teaching assignments, is a difficult problem, but it is an essential one to solve if undergraduate surgical teaching is to achieve the potential stature it should have.

Research

Research activity within the department is conducted in the college in conjunction with clinical research involving study of patients in the Presbyterian and Delafield Hospitals. Work in the laboratories may be grouped into six main spheres of interest: cancer, cardiovascular disease, surgical metabolism, gastrointestinal physiology, wound healing and surgical bacteriology.

Cancer research may be divided into three broad approaches which differ in method but frequently overlap in application. The first approach includes experiments designed to elucidate the nature of malignant growth including the long-term studies of the mouse mammary carcinoma milk factor by Professor Cushman D. Haagensen; studies of tissue growth in culture and factors influencing it by Professor Margaret Murray; studies of the relationship of growth-controlling factors in wounds to the growth of transplanted tumors by Professor Edward L. Howes; studies of factors influencing the spread of cancer at operation by Professor Thomas V. Santulli; studies of the response of tumors to chemotherapeutic agents alone or in combination with surgical methods by Dr. Frederic P. Herter. The second group of investigations concern pathological studies of human tumors in relation to their origin, structure, and the natural history of their course. This group includes: studies by Professors Raffaele Lattes and Nathan Lane in collaboration with other members of the department, of the natural history of papillomatosis of the larynx and bronchi, of parathyroid adenomata, of the relationship of colonic polyps to cancer, of malignant melanoma, of lobular "carcinoma-in-situ" in apparently non-cancerous

breasts; studies by Professor Virginia K. Frantz in neoplasms of the thyroid and other endocrine glands. Thirdly, clinical studies are directed toward devising and determining the effectiveness of methods of treatment, including: studies by Dr. Haagensen on the refinement of selective criteria of operability in carcinoma of the breast; studies by Professor David V. Habib of the problem of lymphedema following radical breast operations; an analysis by Professor Grant Sanger of the natural history of carcinoma of the esophagus as demonstrated by the patients treated at the Francis Delafield Hospital; a further study by Dr. Charles W. Findlay, Jr. on the use of supraclavicular fat pad biopsy in the diagnosis of carcinoma of the lung; a group of coordinated studies by Dr. Carl R. Feind related to routes of spread and methods of treatment by locally circulated chemotherapeutic agents of various neoplasms of the head and neck; studies by Dr. Clare Stein of methods of control of the cachexia of cancer; studies by Dr. Herter and Dr. Malm of isolation-perfusion techniques in cancer chemotherapy and studies in conjunction with research fellows on the endocrine response to stress in the elderly and debilitated, on the management of colon carcinoma in reference to suture line recurrence and on methods of intestinal repair to compensate for gastric reservoir loss following total gastrectomy.

Cardiovascular research includes basic studies in the pathologic physiology of cardiovascular disease, laboratory studies to develop and refine clinical methods in diagnosis and treatment and clinical studies on patients who require vascular or cardiac surgery.

Professor Ferdinand McAllister, in conjunction with Dr. Julius Jacobson, Dr. Robert Bertsch and Mr. Gerald D'Alessio has studied the rate of deposition of cholesterol in the arteries of exercised as opposed to non-exercised animals. The role of metabolic stress is also being evaluated by comparing the rate of development of atherosclerosis in adrenalectomized animals with normal exercised animals.

Professor Aaron Himmelstein initiated a long-term study of the effects of pulmonary arterial hypertension in animals and the possibility of reversal of these by corrective surgery. A study of factors of high flow as contrasted to resistance is

a special feature of this study, which will be continued by Dr. Malm.

Professor Deterling concluded a ten year study in laboratory animals of the healing of vascular grafts following various methods of preservation in comparison with synthetic plastic fabric arterial substitutes. Studies were carried out by Dr. Shivaji Bhonslay, Dr. Norman Thomson, Dr. Malm, Dr. Howard Reichman and Mr. William Duncan, under the supervision of Dr. Deterling, of the physiologic changes following extracorporeal circulation with and without cardiac arrest and open heart operations. Comparison of different methods of maintaining circulation and oxygenation, by means of studies of the metabolic and respiratory effects following termination of perfusion, was the primary objective. These studies were correlated with comparable studies on patients undergoing open heart surgery.

Dr. Malm, in collaboration with Professor William Rogers, Assistant Professor of Anatomy, carried out a study of phonocardiographic recordings of experimentally produced cardiac defects, correlating them with clinical findings on patients whose lesions were verified at operation. Also related were studies by Dr. McAllister and Dr. Reichman on the development of prosthetic valvular replacements for the mitral and aortic valves, respectively.

Clinical studies of patients undergoing open-heart surgery were carried out by the same team. This program received added impetus in the Spring of 1959, by a generous grant from The John A. Hartford Foundation, Inc. Dr. Deterling was in overall charge until July 1, 1959, following which Dr. Himmelstein directed it until his death in December. Dr. Malm is now in charge.

Dr. McAllister, with Dr. Julius Jacobson and Dr. Youssif al Naamen, have continued their studies of collateral circulation following occlusion of arterial grafts inserted for the treatment of peripheral arterial disease.

Professors Arthur H. Blakemore and Arthur B. Voorhees, Jr. have been engaged in a long-term study of results of aortic replacement for aneurysm and the effects of portacaval anastomosis in the treatment of portal hypertension.

Surgical metabolism studies center about the metabolic ward which is under the direction of

Professor Harold G. Barker. Changes in steroid physiology in surgical stress and cirrhosis of the liver have been under study by Dr. Howard Mittelman. He has been especially concerned with the relation of aldosterone physiology to ascites in cirrhotic patients and the steroid physiology in patients and animals during open heart surgery. The etiology and treatment of ascites in relation to portal pressure, liver function, salt metabolism, renal function, body water compartmentalization, blood and plasma volume, serum proteins and the effects on these of portacaval shunt operations are under study. With Dr. Voorhees, a study has been made of hepatic coma, its relation to ammonia intoxication, and its prevention and treatment with intestinal antibiotics.

Intestinal absorption has been studied in malabsorption states, pancreatic deficiency and following extensive gastric resection. With Dr. Malm, the physiology of normal fat absorption by means of I^{131} tagged fat has resulted in improved methods for quantitating fat absorption. A method of small intestinal mucosal biopsy in intact man has been devised. Studies of the relation of fat consumption and absorption to atherosclerosis have been begun.

In addition to the metabolic studies outlined above, physiologic studies of the esophagus, stomach, small and large bowel have followed two research lines.

Professor Edmund Goodman, with Dr. Henry Colcher, Associate in Medicine and Mr. George Katz, have continued their studies by original techniques which permit simultaneous measurement of electrical activity and pressure changes in the esophagus, stomach and small intestine. Applied to the esophagus, it has helped to demonstrate the physiologic disturbances associated with achalasia, esophageal dysfunction following long-standing hiatal hernia and other abnormal states. In the post gastrectomy patient, criteria for diagnosis of the "dumping syndrome" have been established. A study of disease of the antrum has been begun in cooperation with the Department of Radiology. Long term studies of small intestinal physiology has been begun on the research service at Goldwater Hospital. In cooperation with Dr. William B. Seaman, Professor of Radiology and Director of the Service, arrangements have been made in radiology for

simultaneous cineradiography of the bowel by means of specially designed image intensifier.

Professor Robert Hiatt with Dr. Irving Goodman, Associate in Biochemistry (Surgery), began a study of ulcerative colitis and regional enteritis. Isolated segments of intestine have been transplanted under the skin of dogs as a preparation for study of circulatory and nervous control of function. Histochemical studies of bowel segments removed from patients with ileitis and colitis have revealed an apparently consistent change in mast cell location and number. Studies of the enzyme, a B-thioglucosidase, not previously known to occur in mammalian species, in normal and diseased intestine are in progress. Various new chemical compounds of potential activity in modifying abnormalities in intestinal function are being synthesized to gain insight into biochemical determinants of bowel action and as possible chemotherapeutic agents.

Dr. John F. Prudden has continued to develop the lead provided by his initial observations indicating that wounds in the presence of local cartilage will heal faster than normal controls. The work has been divided into: extensive testing of previously known purified components of cartilage; examination of the effects of cartilage pellet implantation at a distance; and testing of fractions of the cartilage prepared in his laboratory. This work has shown conclusively that there is an extractable and, therefore, presumably purifiable and injectable, biologically active component of cartilage. Further characterization is needed and under way. Other projects being studied are: an evaluation of the nutritional effect of implantation of a segment of small bowel into the descending colon in animals losing large amounts of weight secondary to massive (80%) small bowel resection (this is a study of weight changes and of fat absorption using the tracer techniques developed in the Metabolic Unit); a thorough analysis of the results of all cases of chronic ulcerative colitis subjected to operations of any sort between 1945 and the present, and a continuation of the long-term study of growth hormone and insulin upon the clearances of urea, glucose and alpha amino nitrogen. The cartilage work has been done in collaboration with Dr. Frank Gump and Dr. Takayuki Inoue; the small bowel nutritional study, with Dr. James Chandler;

the colitis study with Dr. Inoue and Dr. Hiatt and clinical evaluation of growth hormone and insulin on renal clearance, with Dr. Habib and Dr. Chandler.

During the past year, research has been centered on the problem of control of staphylococcal infections within the hospital. Bacteriophage patterns of all coagulase positive staphylococci were correlated from cultures from the following sources:

Infections in postoperative patients, respiratory and gastrointestinal tract of postoperative patients, infections in patients on admission to the hospital, infections in hospital personnel on the surgical services, infections in patients in the outpatient clinics, organisms from the air of operating rooms and surgical wards, and organisms from the respiratory tract of surgical personnel.

Miss Johnson reviewed all of the charts of patients undergoing three common categories of "clean" operations in six years over the past twelve year period to determine whether a significant change in percentage of infection has occurred, especially in relation to "prophylactic" antibiotic therapy. It has been found that no significant trend toward a higher infection rate has occurred on this service.

Presbyterian Hospital

One of the most noteworthy events was the addition of the facilities of the special recovery room for the postoperative care of open heart and other critical postoperative cardiovascular patients. The number of patients so cared for has not been large but one can only comment with a feeling of deep appreciation and gratefulness for the foresight which made possible a service which is so essential to the survival and recovery of these patients. The installation of new autoclaves and other sterilizing equipment and the remodeling of the scrub rooms and work rooms on the main operating floor has now been completed. During the course of this construction work, it was necessary to equip the two operating rooms off the Emergency Ward on the third floor of Vanderbilt Clinic to provide space to replace that temporarily lost on the eighteenth floor. This accounts for the fact that there was no drop in the number of operations performed during the year. Actually the number increased slightly.

The arrangement on the third floor worked very well and offers a much needed solution to some of the problems of achieving improved medical care by relieving the pressure in the operating room resulting from overcrowded surgical schedules. Continued utilization of these excellent, heretofore inadequately used facilities, should be provided.

There has been little change reflected in the statistics of patient care during the past year. As indicated in the accompanying table, the number of "standard" procedures has remained without significant change for the past decade, whereas the larger, more complex, procedures have almost doubled. There has been no lack of good teaching cases on the wards, though the proportion of ward cases to private is less than the desirable half. Though some gain has been made in utilizing our private patients in teaching, it appears unlikely that really effective teaching and training in surgery can be done with private patients alone.

The follow-up clinic continues to be well attended and has provided material for three long term studies of surgical results which will be published next year. Surgical specialty clinics, especially those such as the cardiovascular, gastrointestinal, thyroid and head and neck clin-

ics which function as joint interdepartmental activities, have been busy centers of teaching and consultation care.

Francis Delafield Hospital

The surgical service of the Francis Delafield Hospital continues to grow. This growth is well shown by a comparison of the data regarding its clinical work during the academic years 1953-54 and 1958-59. In 1953-54, there were 3,936 clinic visits while there were 5,911 in 1958-59. 319 major operations were performed in 1953-54, while in 1958-59, 690 were done.

The breast service continues to be the most active of the four surgical service divisions, but it is gratifying to see the increased number of head and neck cases being referred for definitive care. The great importance of follow-up on each patient is stressed. A recent study of the follow-up staff at Delafield has indicated that ninety-nine per cent of the patients have been followed. This figure must be viewed in the light of the fact that these patients are underprivileged and many of them transient.

The wards and clinics of the Delafield Hospital are a training ground for American Cancer Society Fellows and the Resident Staff of the Columbia-Presbyterian Medical Center. Both the

PATIENT CARE STATISTICS

TOTAL OPERATIONS	1951	1958	1959
Surgical Service	4,105	5,928	6,486
Per Cent Ward Operations.....	53%	43%	45%

CLASSIFICATION

A. "Standard"

Thyroid	364	310	357
Gastrointestinal	530	620	651
Appendix	203	164	199
Gall Bladder, Pancreas.....	341	432	469
Hernia	320	526	555
Other Abdominal	309	461	505
Rectal	307	338	392
TOTAL	2,374	2,851	3,128

B. "Complex"

Thorax, Cardiovascular	164	322	357
Breast	328	542	598
Superficial and Plastic.....	675	1,288	1,169
TOTAL	1,167	2,152	2,124

C. Babies Hospital	564	683	931
Recovery Room (general and specialty surgical patients).....	7,771	10,525	10,717
Transfusions (Blood Bank total).....	13,537	12,626	12,146

Attending and House Staff of the Surgical Service at Delafield are completely integrated with the Surgical Service of the Presbyterian Hospital.

With the increased number of patients and also the expanded operative care, the head and neck service, under Professor David M. Ju and Dr. Carl Feind, is being assisted by Dr. Cadavan O. Griffiths, the gastrointestinal service under Dr. Frederic P. Herter assisted by Dr. Sanford Weissman, the chest service under Dr. Charles W. Findlay assisted by Dr. James R. Malm, and the breast service under Professor Cushman D. Haagenesen, continues with the assistance of Dr. Claire A. Stein. Dr. Wolfgang Ackermann continues with his studies of the lymphatic and blood vessel routes of metastasis and of biopsy of bone metastases. These studies have been very helpful in elucidating the natural history of cancer. Other research by members of the Surgical Staff of the Delafield Hospital is outlined in the section on research.

Bellevue Hospital

During the year 1959, the First Surgical Division continued an active general surgical service including fractures, orthopedic and plastic surgery. The peripheral vascular clinic, gastrointestinal clinic and plastic surgery clinic have functioned effectively supervised by members of the Attending Staff.

During the year 1958, there were 1,797 total admissions, 719 operations and 6,942 visits to General Surgical Clinic, 1,033 to Fracture Clinic, 955 to Gastrointestinal Clinic, 176 to Rectal Clinic and 72 to Peripheral Vascular Clinic—making a total of 9,179 outpatient department visits.

Mary Imogene Bassett Hospital

The expanding sphere of influence of the Bassett Hospital, the increasing acceptance of surgical therapy by the rural inhabitants of Otsego County, and the aging character of the population, continues to bring to the Surgical Service problems of increasing interest and magnitude. Though numbers of patients alone should never be considered criteria of progress, it is nevertheless gratifying to report continued growth. The number of surgical procedures tabulated in the

statistical summary for 1958, is the largest in the history of the hospital.

During the latter part of August, 1958, Dr. Frank Glenn, Lewis Atterbury Professor of Surgery at the Cornell University Medical College conducted daily teaching rounds for the surgical house staff and seminars for the students, operated or assisted members of our resident staff daily and delivered a formal lecture to our entire group as well as numerous physicians from adjacent areas. Dr. Harold Zintel, Surgeon-in-Chief at St. Luke's Hospital and Clinical Professor of Surgery at the College of Physicians and Surgeons, Columbia University, visited us in the same capacity during the month of September, 1959.

In order to have available split thickness grafts of skin for immediate use as homografts, Professor James Mithoefer and Dr. David J. Hosbein have established a Skin Bank. Microscopic sections of skin stored at 4° Centigrade in a buffered nutrient solution containing antibiotics appear after twenty-four days to be essentially similar to fresh skin.

Professor Alfred Jaretski, in association with Doctors John Mithoefer and Fred Holford, has undertaken a study to improve the diagnostic accuracy of catheterization of the left chambers of the heart in the evaluation of mitral insufficiency. Dr. Jaretski's utilization of Vinyon-N for enlargement of the outflow tract from the right side of the animal heart, now in progress for four years, continues to prove effective. Drs. John Mithoefer and Fred Holford of the Cardio-Pulmonary Laboratory are conducting a study of the effect of morphine sulphate on the pulmonary reserve of preoperative and postoperative elderly patients.

During the year, Dr. John Mannick, in collaboration with Professor John H. Powers, James Mithoefer, and Joseph W. Ferrebee, has elaborated methods for the experimental production of chronic azotemia in animals to determine its effect on the acceptance of renal transplants by the uremic host. These experiments were supported by a grant from the United States Public Health Service. Dr. Mannick returned to Boston on July 1, to complete his surgical residency training at the Massachusetts General Hospital.

The completion of the new laboratory for surgical research, now in construction, will fulfill the

requirements of the department for many years and allow us all to pursue investigative studies with enthusiasm and efficiency. In the immediate future, new quarters for the proper care of animals outside the laboratory will be essential. Dr. Jaretzki is chairman of a committee currently investigating the requirements for such an animal farm.

The statistical data relative to the Surgical Service may be found in the tabulated summary for the year. There were 1,091 patients discharged from the service. Nineteen autopsies were performed; the necropsy rate was eighty-six per cent.

St. Luke's Hospital

With a total hospital bed capacity of 523 beds, the general surgical service admitted 4,502 patients and performed 4,726 operations on inpatients. There were 67,974 visits to the emergency room in the general surgical service clinic, including the subdivisions of plastic surgery, gynecology, proctology, pediatric surgery and fractures; there were 23,422 visits during the year. Seven hundred and seventy-eight operations were performed in the surgical clinics on an outpatient basis.

The general surgical service research laboratories at the present time have eighteen active investigational projects in process. Five hundred and seventy-five operations were performed in the general surgical research laboratories during the year. Also, during the year, there were thirty-five reports published in the surgical literature by members of the general surgical service.

Roosevelt Hospital

More than 5,500 operations were performed in the operating rooms during the year of which 2,547 were major procedures. A daily average of twenty ambulance calls and 100 Emergency Department patients insures an unusual supply of patients with traumatic and other acute problems.

Clinical research has proceeded well during the year and the new Surgical Research Laboratory was opened in September, filling a long-felt need in the teaching program.

Mount Sinai Hospital

The volume of general surgery continues to

be one of the largest in New York. There was a marked increase in thoracic surgical cases, vascular surgery, and head and neck cases. A milestone in Mount Sinai's surgical history took place in January, 1958, when our first open heart surgical case was successfully performed.

The residency training program was reorganized in July, 1958. Twenty-one residents served on the surgical house staff. There are now three senior residents, three third-year residents, seven second-year residents and six first-year residents. Represented in this group are doctors from Argentina, Brazil, Canada, England, Israel and the Philippines.

The laboratory was the center of an active research program embracing fifteen major studies. Of special interest was a project dealing with the effect of cardiac irradiation on the animal heart and its circulation. This was a study of survival and collateral development following coronary artery ligation in laboratory animals after irradiation.

The department also did work on the effect of direct subendocardial injection of autogenous arterial tissue on the development of coronary collateral circulation; on the development of a mechanical cardiac massage unit; radiographic visualization of gastrointestinal bleeding sites; the influence of thyroidectomy on the development of experimental ascites; and the percutaneous splenoportography in normal and ascitic laboratory animals.

Other studies dealt with the relationships between intrasplenic, hepatic wedge and intra-abdominal pressures; liver regeneration following partial hepatectomy in normal laboratory animals and in those with carbontetrachloride-induced cirrhosis; the development of a suitable aortic valve prosthesis and the effect of pulmonary and myocardial infarction on serotonin metabolite excretion.

Subjects of investigation also were left ventricular function and morphology after left ventriculotomy; chemical pleurodesis and pleurectomy as applied to the treatment of chronic or recurrent spontaneous pneumothorax; the effect of pump oxygenation on blood stable factor; blood volumes on pre-operative surgical patients; and the mechanical support of cardiogenic shock by obstruction of the abdominal aorta with extra-

corporeally pumped circulation to the distal aorta.

There were 1,275 admissions to the Surgical Ward Service, 4,190 operations (ward and private) and 9,234 clinic visits.

Montefiore Hospital

As an expression of the concentration of effort on cardiovascular problems in the Surgical Research Laboratories, the volume of clinical operations in this field for 1959, number over 275. The total of open heart operations, utilizing the extracorporeal pump oxygenator as organized by Dr. George Robinson, now exceeds 100. A cardiovascular trainee from the National Heart Institute has been added to the group investigating obstructing lesions of the aorta and extremities and the metabolism of arterial tissue, under the leadership of Dr. Henry Haimovici. A joint study of the critical evaluation and surgical correction of obstructions in the branches of the aortic arch has been formulated with Dr. Charles Carton of Neurosurgery and Dr. Jerome Shapiro of Diagnostic Roentgenology, and the study of techniques for the reconstruction of small arteries has continued with Dr. Carton. An investigation of cancer chemotherapy and isolated limb and organ perfusion is also being conducted. In addition there are a number of projects involving the production and correction of congenital and acquired cardiac lesions. Teaching has focused primarily on the Residents, one of whom, Dr. Seymour Furman, published his unique contribution of an intracardiac pacemaker, based on fundamental work done by him during his year in the Research Laboratory. The overall volume of clinical and operating room work, both ward and private, has continued its annual increase.

Outside Activities

During the period covered by this report, programs of one or more days were arranged for five surgeons groups. In February, the Upstate Society of Thoracic Surgeons held a three day meeting. On March 20, a "dry clinic" was arranged for the College of Chest Physicians. In April, an operative clinic and panel discussion on portacaval surgery was arranged for the annual meeting of the Alumni of the Surgical Service. On this occasion the Stevenson Memorial lecture was given by Dr. Sumner L. Koch of Chicago. In

May, the Surgeons Club, which includes many of the most distinguished senior surgeons of this country, visited for a day of interesting discussion. In October of 1958, a joint meeting of the surgical staff and the staff of the Mary Imogene Bassett Hospital was held in Cooperstown, at which the Bassett Hospital staff presented an interesting program of their research. In October of 1959, the Presbyterian surgical staff returned to Cooperstown to present their work to the Bassett staff. These annual joint conferences within the department are always well attended and much enjoyed.

The Allan O. Whipple Surgical Society met in Cleveland, Ohio at the Medical School of Western Reserve University in January. The excellent program which had been painstakingly prepared consisted of an exposition of changes which have been made and are being made in their medical school curriculum as they affect the training of a surgeon. It was directed and moderated by Associate Dean Jack Caughey, formerly on the medical staff of Presbyterian Hospital. Pleasant, informal surgical alumni gatherings were held at the Clinical Congresses of the American College of Surgeons in Chicago in 1958, and in Atlantic City in 1959. It is planned to continue to hold these each year.

Over one hundred out-of-town meetings were attended by members of the department, including several abroad of which the most important were the International Cancer Congress in London, the World Health Organization meeting in Geneva, the meeting of the American College of Surgeons in Stockholm and the International Surgical Society in Munich. Seventy-nine papers were read at these meetings, many of which have been published among the seventy-two publications listed in the appended bibliography.

In October of 1958, the department had the privilege of a visit from Professor Philip Sandblom, Professor of Surgery and Rector of the University of Lund, Sweden who served for a week as "Professor pro tempore." In October of 1959, Professor William Longmire, Professor of Surgery at the University of California of Los Angeles, similarly visited and presented the fourth annual Leon E. Sample lecture. A new series of lectures, generously supported by the Fenwal Company and devoted to discussion of problems related to blood transfusion, was in-

augured by Dr. John Gibson of Harvard on May 13th, 1959. The second Gibson lecture was given by Dr. Ivan Brown of Duke University on November 18th. This series of lectures promises to be of great interest and usefulness in the exchange of knowledge in this increasingly complex and important field. Other surgeons who gave less formal lectures at the cardiovascular conferences, included Dr. Henry T. Bahnson of John Hopkins, Dr. John Kirklin of the Mayo Clinic, Dr. Charles Hufnagel of Georgetown University, Dr. Frank Gerbode of Stanford University and Dr. John Templeton of Jefferson Medical College.

Professors Muneo Oka of Japan, Antonio Montero of Chile, Gherardo Forni and Edmondo Malan of Italy, Ivo Popovic of Yugoslavia and Alfons Mackowski of Poland visited for periods of a few days to a week. In addition, fourteen International Cooperation Administration Visiting Fellows from Brazil, Turkey, Iraq, Iran, Pakistan, India, Indonesia, Thailand, Cambodia and Taiwan spent varying periods visiting the department, as well as two China Medical Board fellows from Taiwan and Malaya, nine other surgeons from Sweden, Great Britain, Cuba, Mexico, Colombia, Brazil, and Peru and a group of nine medical students from Uruguay.

Probably a more significant understanding of the aims, methods and accomplishments of American surgery than can be gained by these numerous transient visitors, is afforded by the attendance for a year or more of foreign visiting Fellows. Unfortunately restrictions of time, financial support and legal problems related to responsibility for patient care, make it difficult to give full residency training to non-citizens. Nevertheless, much can be gained by Fellows who attend rounds, conferences and clinics, and who take part in laboratory research programs. Five such Fellows have joined the department in this capacity. Dr. Jon Slowikowski of Poland worked with Drs. Blakemore and Voorhees from September, 1958, until July, 1959, on a Rockefeller Foundation Fellowship. Dr. Yousif al-Naamen of Iraq came as a New York Heart Association Fellow in July, 1958, and is continuing his work in blood vessel surgery under Professor Ferdinand F. McAllister. Dr. Takayuki Inoue of Japan has been working under Dr. John Prudden on his research in wound healing. Dr. Antonio

Demetz of Italy came to us in November, 1958, and is continuing his work with Drs. Frederic Herter and James Malm on perfusion methods in cancer chemotherapy. In July, 1959, Dr. Mario Roldan of San Salvador, and in September, Dr. Ching-Chang Liu, American Bureau of Medical Aid to China Fellow from Taiwan, joined the open heart surgery research group under Dr. Aaron Himmelstein. In addition to these Fellows, Dr. Harith Sadik of Saudi Arabia has served as Assistant Resident at the Francis Delafield Hospital and Dr. Beshir Zikria of Afghanistan has served as Intern and Assistant Resident at Bellevue Hospital. In this manner Medical Center international educational responsibility continues to be met.

Honors

Professor Emeritus Jerome P. Webster was awarded an honorary citation and plaque by the American Society of Plastic and Reconstructive Surgery in October, 1958. He was made a Fellow of the Cesari Barbieri Center of Italian Studies of Trinity College and Affiliate of the Royal Society of Medicine of Great Britain, a Trustee of the New York Academy of Medicine and President of the American Bureau of Medical Aid to China. In 1958, he served as the first Visiting Professor of Plastic Surgery at the University of Rochester. Professor Emeritus Arthur Purdy Stout was elected President of the New York City Cancer Committee and awarded a special citation by the American Cancer Society. Professor George H. Humphreys, II was elected a Governor of the American College of Surgeons in 1958. Professor Edward D. Howes was given a Fulbright award in order to serve during 1959-60, as Visiting Professor at the University of Strasbourg, France. He was also elected to the Alumni Board of the Yale University Medical School. Professor Rudolph N. Schullinger was elected President of the Alumni Association of the College of Physicians and Surgeons. Dr. Lawrence W. Sloan was elected to the Executive Council of the American Goiter Association. Dr. Edmund N. Goodman was made Chairman of the section on surgery of the New York State Medical Society and Consultant to the New York State Compensation Board. Dr. Thomas V. Santulli served as Visiting Professor of Pediatric Surgery

at the Fitkin Memorial Hospital in Neptune, New Jersey.

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Urology

JOHN K. LATTIMER, *Professor and Chairman of the Department
Director of Service*

Squier Urological Clinic

The Squier Urological Clinic has made outstanding progress in the year 1959, best shown in the great expansion of its investigative and research work as applied to better methods for dealing with urological diseases. For example, in the Annual Contest for Urology Residents in New York City, the Urological Service of the Presbyterian Hospital submitted more completed research projects than all of the other Urological Services in New York City put together. One of the papers (a new treatment for uric acid stones, by Dr. Frank W. Longo) won the first prize. Thus the investigational side of the Squier Clinic is beginning to catch up to the abundant facilities for patient care which make this service one of the world's largest urological clinics.

Dr. George Francis Cahill

The Department and the Urological Service were severely shocked on July 24, 1959, by the sudden death of Dr. George Francis Cahill, its Professor Emeritus and Director Emeritus, from a coronary occlusion. Dr. Cahill was one of the greatest figures of the urological world, President of every major Urological Society and a tower of strength and vigor in the era which overlapped the great surgeon and the enquiring investigator. Friends and associates travelled great distances to attend his funeral services. He was buried at the Arlington National Cemetery in Washington, D. C. and was eulogized in a special service at The Pauline A. Hartford Memorial Chapel at the Presbyterian Hospital on September 17, 1959. The Squier Clinic owes much of its position of leadership in adrenal surgery and urological surgery in general, to this great and kindly man. His passing has been a tremendous loss to the Medical Center.

Training

The Pediatric Urological Service in the Babies Hospital has been the site of several successful

projects for the improved treatment of various conditions and has been extremely popular among visiting trainees and observers. Improvement in the quality and intensity of undergraduate teaching has brought about a noticeable improvement in the quality of the applicants for the post of House Officer on the Urological Service. The effectiveness of the Squier Urological Clinic in its field is shown by the increasing stream of visitors, the increasing number of students who come here to participate in our training program and the increasing numbers of publications in the scientific literature stemming from research work done here. The expansion of our Urological Pathology Service under Professor Meyer M. Melicow has been progressive. Work is proceeding on Dr. Melicow's and Dr. Aurelio C. Uson's textbook on Urological Pathology. Dr. Melicow has contributed chapters to several textbooks during the past year.

A formal postgraduate course in urological surgical pathology has been organized by Dr. Melicow in response to the great demand for such a course. In previous years, at the time of the examinations for accreditation by the American Board of Urology, many candidates came to Dr. Melicow, who conducted such a course informally. His teaching will be done on a much more satisfactory basis in the future. Dr. Melicow has remarked that in the past each one of his trainees passed the examination without any difficulty whatsoever.

Another feature of the graduate educational program is the fact that our Residents are sent on a visiting fellowship during their last vacation period, immediately preceding their senior residency. At this time they visit all of the major clinics of the East, arranging their visits so that maximum efficiency can be attained in watching experts in various lines of endeavour do their favorite operations. This has been extremely fruitful experience for these young men to have an opportunity to compare their training with

that obtained at other clinics. In turn we have had with us from abroad Shir Ali Chouaib from Afghanistan, Dr. Bayouk Farvar from Iran, and Dr. Gil Vasquez, from the Philippines, studying with us.

Visitors

Among the individuals from other parts of this country and abroad who visited the department were:

Dr. Harith R. Sadik, Saudi Arabia Jeddah General Hospital
 Sister M. Dymrna, St. Joseph's Hospital, North Bay, Ontario, Canada
 Edward C. Parkhurst, Massachusetts General Hospital, Boston, Mass.
 P. D. DePharos, Urology Department, Surgical Clinic, Zurich, Switzerland
 Arne Anderson, Copenhagen County Hospital, Denmark
 Dr. Louis Corvalan, Santiago, Chile
 Hussein Talib, Baghdad, Iraq
 Otto Boden, St. Hildegard's Hospital, Kon/Rh., Germany
 S. Dangkusmondo, Jaffa, Indonesia
 M. E. Godmee, Los Angeles, California
 J. N. Camara, Cebu City, Philippines
 J. Basoqal, Guatemala, C. A.
 D. Innes Williams, London, England
 H. Harada, Yokohama University School of Medicine, Yokohama, Japan
 Roger W. Barnes, Los Angeles, Cal.
 Victor Lane, Meath Hospital, Dublin, Ireland
 H. S. Brady (St. Peters, Middlesex), New Brunswick, N. J.
 H. S. Bhat, Christian Medical College, Vellore, India
 Dwayne E. Howard, Sioux City, Iowa
 John A. McFarlane, Sioux City, Iowa
 James Mortenson, Melbourne, Australia
 John Hellstrom, Stockholm, Sweden
 Victor Politano, Duke University, Durham, N. C.
 Ben J. Floyd, Duke Hospital, Durham, N. C.
 David M. Davis, Haverford, Pa.
 Kenneth MacKinnon, Montreal, Canada
 Richard Towne-Warwick, Middlesex Hospital, London, England
 A. Richards, Kern General Hospital, Bakersfield, California
 Jose Taliberti, Sao Paulo, Brazil
 Avery E. Wood, Watsonville, California
 Wyland F. Leadbetter, Massachusetts General Hospital, Boston, Mass.
 Pauline M. Boetten, The London Hospital, London, England
 William H. Morse, University of Tennessee, Memphis, Tenn.
 Alfonso de la Pena, Madrid, Spain
 J. de la Cruz, Philadelphia, Pa.
 Robert S. Hotchkiss, New York University Medical School, N. Y. C.
 David Erlik, Government Hospital, Ramboun, Haifa, Israel
 Johannes Meyer, Copenhagen, Denmark
 Ken Koshoka Tokyo, Japan

O. S. Rodriguez Rasario, Argentine
 Marzocchi Mario Alper, Algeria
 Robert A. Merrell, Jr., Duke University School of Medicine, Duke, N. C.
 George T. Pack, Memorial Hospital, N. Y. C.

An important new development in the training program has been the participation of staff members from the urological staffs of the Kingsbridge Veterans Administration Hospital and the United States Public Health Service Hospital on Staten Island. These hospitals have much to offer in the way of paraplegic experience, tuberculosis experience and experience in special areas not available in quantity at Medical Center. In return, the staff members from these hospitals enjoy the exposure to pediatric and female urology which are not as plentiful at their hospitals. The caliber of the personnel in these hospitals is particularly good and a valuable exchange of information as well as greatly expanded case material for mutual study is expected from these associations.

New Developments in the Field of Patient Care

A special laboratory has been established for the study of urinary infections by resistant bacteria. The seriousness of this matter of resistant bacteria, all across the country, is nowhere more acute than in the development of strains of bacteria which are especially refractory to treatment, after infecting the kidneys, bladder or prostate. This laboratory, under Dr. Harry Seneca, has made an extended study of the bacterial population of the Urological Service. Every patient who walked through the hospital door into either the Out-Patient Urology Service, or the hospital urology beds was tested to determine what bacteria were present in this urinary tract, during one entire week. This performance will be repeated at intervals of every six months to determine any shifts in the bacterial population in the Urological Service, as times goes on. In this way it will be possible to detect and document any shifts in a dangerous direction. It was noted that the bacteria which had the capacity to develop severe resistance also had certain classifications of the germs involved (Gram negative bacilli) on the basis of their enzyme activity. As a result, a new method for anticipating drug resistance has been developed and it is now being

tested. This, in turn, has led to the investigation of a potentially very powerful new method for curbing resistant bacteria through the application of enzyme blocking agents. New synthetic media for the testing of bacteria along these lines have been developed in this laboratory. Infections of the kidney (pyelonephritis) have been induced in rats, using germs from human patients, and treated with combinations of cortisone and antibiotics. Many of these rats have developed a condition where germs are in the urine but there is no pus present. Attacks of fever and severe infections are intermittent in these animals. This situation is very similar to that found in the human and may lead to more effective treatment.

During 1959, several new and effective drugs were tested in the laboratories and services of the Squier Clinic. These were Declomycin (demethylchlortetracycline), a powerful new broad-spectrum antibiotic, more powerful than tetracycline; Colymycin, a drug effective against some of the most refractory coliform germs; Kanamycin, effective against ordinary germs as well as tuberculosis and Madribon, a new sulfonamide. Other drugs tested were synthetic penicillin, Cycloserine and Neohydrin.

Kidney Tuberculosis Research

The research unit for genitourinary tuberculosis at the Medical Center, working in conjunction with the similar unit of the Kingsbridge Veterans Administration Hospital and with the Public Health Service on Staten Island, has continued to be one of the leading sources of information on the treatment of this disease in the world. With the continued support of the New York Tuberculosis and Health Association, it has been possible to increase the number of patients treated and almost double the number of new patients seen during the past year, as a result. It continued to be apparent that treatment with three drugs was superior to treatment with two drugs and the present plan of continuing treatment for two continuous years has been executed successfully. The standard treatment regimen has been a combination of Isoniazid, Streptomycin and Sodium PAS, augmented by vitamin and pyridoxine therapy. Currently, the tuberculosis unit is testing new drugs such as Cycloserine and Thiocarbanadin, both of which can be given by

mouth and in conjunction with other drugs. It is felt that if the medications can be administered entirely by mouth and are tolerable for the patient, it is preferable to try for a cure of the disease rather than to give one short course of treatment and repeat this short course if treatment is a failure. In the past the treatment with successive short courses has ultimately failed in a great many patients.

During the past year, this tuberculosis unit has submitted three papers for publication and presented two papers at Medical Society meetings and one scientific exhibit on this subject. The subject of one paper and the scientific exhibit was "Urine Containing Tubercle Bacilli is Infectious for Children." It was published in the Journal of the American Medical Association. This paper demonstrated that the urine which contained tubercle bacilli was infectious for children, since the tuberculin test was positive in twenty-two per cent of the children who were exposed to the urine, as compared to about five per cent in children not exposed. This study was done very carefully over a period of many years. It documented evidence that patients who have tubercle bacilli in their urine are infectious and should be on "precautions." Precautionary measures were discussed in this paper.

Another paper entitled "New Drugs for the Treatment of Genitourinary Tuberculosis" is in press to the Journal of Urology. The relative efficacy of various drugs in use was compared. Still another paper, entitled "Common Mistakes in the Treatment of Genitourinary Tuberculosis" was published as part of the Urological Symposium in the Medical Clinics of North America.

A special outpatient clinic has been established for genitourinary tuberculosis patients. Every patient is checked and the chart carefully examined. A complete urological examination and work-up is done each time these patients come in for check-up. A follow-up card system which contains all data pertinent to the patient is kept up-to-date. Similar systems are being arranged at the Public Health Hospital on Staten Island, as well as at the Kingsbridge Veterans Hospital, which has an equally large research unit for this disease. When a patient is diagnosed as having tuberculosis of the urinary tract he is interviewed regarding his contacts, his previous

history of tuberculosis, previous medications and associated tuberculosis in other parts of the body. Studies were made of various new preparations of PAS, said to be more easily tolerated. Grants from the American Trudeau Society and the New York Tuberculosis and Health Association have made it possible for us to train visiting fellows in this field. One was Dr. Gil Vasquez from Manila, P. I., who is now continuing this work in Manila and the other, Dr. B. Farvar from Iran, who is currently working on the project and working to develop better methods for quick culture of the organisms after more rapid concentration of the urine specimens. The urine specimens are being sucked through a sterile millipore filter which can be floated on culture medium immediately with the hope that more rapid identification of the organism will be possible.

Cancer

Dr. Meyer Melicow continued to conduct and direct the Urological Pathology Service in a most effective way. He and Dr. Aurelio Uson have collected over 800 urine specimens from patients with cancer of the bladder in order to determine how many had excessive amounts of beta-glucuronidase and thus might be susceptible to bladder cancer. In patients who had bladder cancer, Pyridoxine, a possible blocking agent for the substances in the urine which might cause cancer of the bladder, has been employed on a large scale in a clinical trial, in an effort to cut down on recurrences of bladder cancer.

Silver 111 has been applied to Foley catheter bags, which can be inserted into the bladder and thus radiate superficial cancers of the bladder by direct contact.

Several new compounds which nullify the hormones of the body have been used in patients with cancer of the prostate where removal or cancellation of hormones ordinarily stops the progress of the cancer of the prostate gland. Several compounds are being tested to determine whether they would reduce the size of the benign enlargement of the prostate.

Dr. Perry B. Hudson, at the Francis Delafield Hospital has continued the detailed analysis of the hormone components in blood coming from the adrenal vein in patients with various types of cancer including prostate and the breast. A

study of the method by which adrenal hormones are created by the adrenal gland has been continued, using radioactive isotopes. Participation in a large scale government-backed study to determine the effectiveness of hormones for the control of cancer of the prostate, has continued at the Delafield Hospital.

Work has been carried out with anti-hormone preparations. In its present phase this work is concentrated on the preparations and study of antichorionic gonadotropins. This anti-hormone has been successfully produced and is being studied *in vitro* and *in vivo* effects in the mammal. Attempts are being made at purification to minimize interspecies effects.

Over 900 patients have been biopsied to determine the state of cancer of the prostate gland and somewhat more than ten per cent of the patients had been found to have cancer of the prostate. Ninety per cent of these cancers were in the patients who had symptoms when first seen, only fifteen percent were operable. A scientific exhibit on "Tissue Diagnosis of Early Prostatic Cancer" was shown at the Annual Convention of the New York State Medical Association held at Buffalo, New York, in May, 1959. It was also shown before the post-graduate symposium at the New York Academy of Medicine and at the Annual Convention of the American Urological Association.

In the process of testing an extract of trypanosomes, originally prepared to raise the resistance of patients to infections, skin reactions were found in patients with cancer by Miss Tebbetts, Dr. Longo and Dr. Seneca. After several hundred patients with cancer had been skin tested, a ninety per cent reliability of the skin test was determined, in this group of patients. Efforts to produce this antigen for large scale skin testing raised technical difficulties that changed the material and made it necessary to seek additional strains of pathogenic trypanosomes. Dr. Seneca was invited to give lectures before the International Symposium of Trypanosome Disease in Rio de Janeiro in July, 1959. This enabled him to pick up the necessary new pathogenic strains and return with them to the laboratory, where he is now working on them. Dr. Seneca also presented speeches before the American College of Physicians, the American Society for Tropical

Medicine, the Antibiotics Symposium and the American Association for the Advancement of Science in Chicago.

The Pediatric Urological Service has operated upon one of the largest series of "Functional Closures" of children with exstrophy of the bladder (thirty-seven cases) recreating these children into a functional pattern, in contrast to their previous miserable state.

A new operative procedure has been devised by Dr. Stanley Braham, for the treatment of hypospadias in children. A new approach to cancer of the prostate gland by removal of the pubic bone across the symphysis to improve exposure, has been studied by Professor Hans H. Zinsser and Dr. Archie L. Dean. It has been done in two patients with excellent exposure and no disability due to the loss of the bone. Experimental work on the development of artificial plastic valves to prevent urine from running backwards from the bladder up the kidneys, has been carried on during the past year by Dr. Clement Furey and Dr. Uson. Artificial valves made of Teflon, a new plastic, have many advantages, but are still not suitable to use in human subjects. Dr. Uson has concentrated on the development of new methods for reconstituting damaged ureters, using adjacent tissues for this purpose, and construction of a new subcutaneous bladder in animals.

Stones

The research group doing work on the prevention of kidney stones, under Dr. Zinsser, has developed or tested several new drugs. Dr. Longo wrote a prize winning paper on the use of Nilevar, an agent which reduces the amount of uric acid in the urine and makes the treatment of uric acid stones much more effective. Pyridoxine deficiency has also been found in some oxalate stone patients and may give leads to new therapy of stone cases. A new irrigating solution, Renacidin, which dissolves some alkaline kidney stones has been used. A new development in the stone diagnosis field is under way of an agent which is excreted through the kidneys and makes non-opaque stones more radio-opaque to X-ray beams. In this way, stones which otherwise would be invisible may become visible. This may make it possible to differentiate between a cancer of

the kidney pelvis and a stone in the kidney pelvis, one of the problems facing the urologist at all times.

Research on an ultrasonic method for the destruction of kidney stones continues. With Dr. Harold Lamport of the Department of Physiology at Yale University School of Medicine and Professor Cyril M. Harris of the Columbia University School of Engineering, our work to assure the safety of such apparatus has continued. Methods for measuring the energy and amplitude of the ultrasonic vibrations at the tip of the ultrasonic drill have been extremely complex and have been carried on for some of the time in the Engineering Research Laboratories of the Department of Engineering at 125th Street. The apparatus was rebuilt and greatly refined during this period and is now undergoing clinical trial in patients. The development of exactly the best type of apparatus for introduction into patients with kidney stones is the subject now under investigation by a team of urologists and engineers. An ultrasonic device to detect the exact location of stone in the ureter and differentiate between stone and other substances is a part of this work. Lack of medical school laboratory space has severely hampered this work, which is progressing slowly.

Cooperation between the School of Engineering and the Medical School has been very rewarding and during the coming year, a combined University effort, including Yale, Rochester, the University of Pennsylvania and Johns Hopkins as well as the Columbia School of Engineering, has been organized for the purpose of expanding the field of medical engineering. Dr. Zinsser has participated in the high level planning for this program.

The study group to determine why kidney stones form, headed by Dr. Zinsser, continues its active work. A paper on the kinetics of calcium oxalate precipitation in the urine of normal and stone building patients was delivered before the American Chemical Society Meeting at Boston by Dr. Zinsser and a paper on Methods for the Prevention of Incrustations on Plastics implanted in Chronically Infected Bladders, was delivered before the American Society for Artificial Internal Organs. A paper on a method by which sperm can be scanned by new electronic means,

was delivered at the West Point Planned Parenthood Conference, as was a paper on the breaking of stones by ultrasonic methods before the International Congress on Medical Electronics in Paris.

A scientific exhibit illustrating a new method for the control of magnesium ammonium phosphate stones in the kidneys through inhibition of bacterial enzymes won a prize at the American Medical Association Annual Meeting in Atlantic City and was shown also at the American Urological Association Meeting. Dr. Gerda G. Mayer, a chemist, working under the direction of Dr. Zinsser's stone group, has revitalized the urine chemistry laboratory on the tenth floor and has improved chemical methods for the analysis of cystine, oxalic acid, xanthuremic acid and citric acid in the urine. Flame photometry has also been added to this laboratory for the study of calcium and sodium levels in the urine. This represents a distinct step forward in the clinical tests available to the staff of the Squier Urological Clinic.

Support for Research in the Department of Urology

Gifts to the Department of Urology have made it possible for many of the advances so far achieved and much of the research now in progress. A most generous legacy was received from the Estate of John L. Given Jr., specifically for the work in uropathology, which is being done under the direction of Dr. Melicow. The Charles A. Frueauff Foundation has contributed generously to the support of research work in the Department of Urology, as has the Lilla Babbitt Hyde Foundation, Harry Gilbert, Reginald Auchincloss, Donald K. David, Hon. Miguel Aleman, during 1959. Also the John K. Lattimer Fund, the Herman Goldman Foundation, Charles Barker, Alex H. Ardrey, the Walter Beinecke Estate, Bristol Laboratories, Hoffman-La Roche, Eli Lilly & Co., Lederle Laboratories, Merck & Company, Schering Corporation, U. S. Vitamin.

There were 2,530 admissions to the Urology Service this year, making a grand total of 49,104 admissions since the inception of the Clinic. Some 1,119 operations were performed during 1959.

Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. JOHN S. TILNEY, *President*

1959 has been an active year for Babies Hospital. Expenditures of \$19,566 included support for the Emergency Nursing Fund, Recreational Therapy, Pediatric Psychiatric Clinic, Volunteer Department, House Staff Loan Fund and Christmas Dolls and Toys for patients.

The Board is most grateful for the many contributions and gifts received during the year from Mrs. B. Rionda Braga, Mrs. Casimir deRham, Mrs. Frederic F. deRham, Mrs. Charles V. Hickox, Mrs. Herman L. Hoops, Miss Hope Kingsley, Mrs. Francis Kellogg, Mr. Arthur Lange, Mrs. Richard Migel, Mr. E. A. Newberry, Platt and Thein, Mrs. Charles M. Post, Jr., Mrs. John Reynolds, Mrs. Samuel Rogovin, Mr. and Mrs. R. Peter Rose, Mrs. Henry C. Taylor, Mrs. Charles Thieriot, Jr. and Mrs. John S. Tilney.

Mrs. Grover O'Neill, Jr., Mrs. Bradley I. Collins and Mrs. Charles M. Post, Jr. were welcomed as new members of the Board.

The resignation of Mrs. Priscilla Havemeyer Eldredge was accepted with much regret. She plans to live in Switzerland.

Mrs. Munn Baker and Mrs. Thomas V. Santulli, co-chairmen of the Volunteer Committee for Babies Hospital, met each month with the other auxiliary representatives to discuss the volunteer program with Miss Vossler, Director of Volunteers for Medical Center. The volunteer tea was well attended by members of the Board.

Babies Hospital had a full complement of volunteers throughout the year in the Tender Loving Care evening program and in the Recreational Therapy and X-ray Departments. Volunteers also acted as floor clerks on the fourth and tenth floors, in Open Heart Surgery Unit and in many other positions throughout the Hospital.

Mrs. Baker was in charge of the "candy stripers" program which was a great success. During the summer months, especially, teenagers participated enthusiastically as nursing aides, many

feeding and escorting children and helping with recreation.

Miss Marjorie Peto, head of nursing at Babies Hospital, has been training volunteers. Guided tours were established for new volunteers to acquaint them with the Hospital.

During the year, bills totaling \$12,450 for aid to eighty-three families were approved by the Emergency Nursing Fund. Generous donations to the fund were made by Mrs. Henry C. Taylor, Mrs. Frederick F. deRham, Mrs. John H. Reynolds and Mrs. John S. Tilney.

Mrs. Douglas Williams served as chairman of the Nursing Committee. Miss Peto reported a full staff of graduate nurses for the year and fine volunteer participation. The Special Nursing Units have been very busy and have been tremendously helpful in caring for patients.

The Board was delighted at Miss Peto's recovery from an operation in the Spring. We regret the retirement of her assistant, Miss Catherine McDermot, after thirty-two years of service at the Hospital.

Mrs. Richard Migel served as group leader of the United Hospital Fund Campaign. Mrs. Thomas V. Santulli was Box Week chairman; Miss Hope Kingsley, Miss Dorothy Mills and Mrs. Douglas Williams were team captains for Babies Hospital. Our quota for 1959 was \$40,686. Mrs. Migel reported 412 gifts, a total of \$35,872; Mrs. Santulli reported \$208 for Box Week. There was 100 per cent worker-participation. Mrs. Migel and Mrs. Santulli and the team captains are to be congratulated for their excellent work.

The housing committee chairman, Mrs. Fred L. Heyes, reported many changes which should be made at Babies Hospital to improve facilities. Normal painting and decorating have been done on an annual basis, but major relocation and alterations have not been undertaken because of proposed complete modernization in the near

future. New furniture has been ordered for all patient areas throughout the Hospital which should be a great improvement.

Mrs. R. Peter Rose, chairman of the Recreational Therapy Department, has continued to improve this department by her tremendous interest, work and generosity. The Board is most appreciative for all that she has done. This year the playhouse which she donated, was completed and it is enchanting. Also through the generosity of Mr. and Mrs. Rose, the library was completely renovated, recatalogued and many new books added. Miss Vickers designed a new book and toy cart which is most attractive and popular. This year, again through Mrs. Rose, an anonymous donor started the Recreational Therapy Special Fund.

Miss Ruth Vickers reports a very full and active year as head of Recreational Therapy Department. Her superb work is an inspiration to all. Her assistant, Miss Siemon of Smith College, is doing a fine job. Miss Dankwerth continues to conduct the musical program for the children assisted by many volunteers.

This year on pleasant summer days, children from Orthopedic Hospital made use of one of the outdoor porches on the recreational therapy floor.

The Board investigated further support of the Pediatric Psychiatric Clinic and voted to con-

tinue this aid because of the financial need and vital importance of the work.

Board members reported news of particular interest at regular meetings of the Board and have been most helpful in keeping us in touch with all Hospital activities. Each month, two board members visited Babies Hospital and reported their findings at the next monthly meeting.

The Board discussed the possibility of giving a benefit first with the other auxiliaries, and then alone. After due consideration, this plan was postponed in favor of a possible annual membership appeal, which is under study at this time.

Among the interesting speakers who addressed the monthly meetings held at the Hospital, and to whom we are greatly indebted for their informative talks, were Dr. Rustin McIntosh, Director of Pediatric Service; Dr. William S. Langford, Director of Pediatric Psychiatric Clinic, and Dr. Melvin M. Grumbach, Head of Pediatric Endocrinology.

To all officers and members of the Board who have helped make this year a successful one, I would like to express my very real thanks and appreciation. The Board is always most grateful, and I am especially so, for the leadership and understanding of Dr. Rustin McIntosh and for the help, interest and services of Miss Elizabeth Callahan, Unit Manager, and all the department heads.

Cribside Social Service Committee

MRS. CONRAD M. RILEY, *Chairman*

The Cribside Committee is pleased to report that the Social Service Department of Babies Hospital, under the guidance of its director, Miss Mildred L. Stillwell, has had a most profitable year.

Participation in the Social Service Educational Program of Medical Center included lectures to student nurses; a share in responsibility for teaching some casework principles and practice to medical students in public health, and supervision of two students from New York School of Social Work in their fieldwork at Babies Hospital. Our activity in the program, which was started a year ago, has been more extensive because of a full staff; the teaching program has advanced.

The Cribside Committee applied to the United Hospital Fund for, and was granted \$400 for social work recruitment. This money was paid out as salary during July and August to an undergraduate student who was a potential social work student. The student worked in Babies Hospital, observed the activities appropriate to a social service department in a hospital, and was closely supervised in simple responsibilities.

The Committee voted \$5,000 for scholarships for two social work students of New York School of Social Work. Only one candidate was chosen. She will receive \$2,300 during her second and last year of school. Upon completion of her

studies, she plans to work in Babies Hospital for one year.

A new card system for monthly tabulation of the various services given by each social worker, reveals many interesting facts: 501 school problems were dealt with; in 801 interviews, the child's care at home was planned; 203 families were aided in their applications for Department of Welfare assistance. Budgeting was discussed with 558 families; 213 housing problems were considered. Services were given to 258 mentally retarded children; 160 unmarried mothers were helped in plans for their child's welfare, psychiatric care was arranged for 264 persons. The greatest number of problems (3,103) were those that parents and children faced both in their relationship to each other and in their attitude toward illness.

The United Hospital Fund Social Service Committee held an all-day conference on problems in the social service departments in voluntary and municipal hospitals throughout Greater New York. Miss Elizabeth Prichard, Miss Mildred L. Stilwell, and Mrs. Conrad Riley attended.

This year, the Lenten Sewing Group met only twice — at the beginning and end of Lent, instead

of every Thursday morning, as formerly. Miss Priscilla Parke of the Premature Nursery spoke at one meeting, and Dr. Sidney Blumenthal, of Pediatric Cardiac Clinic, at the other. The Committee wishes to thank Mrs. Joseph Ramee and Mrs. Neville Booker for entertaining the group. The Sewing Group took in \$345.17, made many tiny baby things and knitted caps and sweaters for the Hospital.

At the spring meeting, Miss Elizabeth Callahan, Unit Manager, spoke on the roles of the Admitting Office and the part that every person in Babies Hospital plays in helping families through periods of illness.

The Bargain Box Thrift Shop netted \$7,324.93. The Committee's appreciation and gratitude go to Mrs. Herman Hoops and her untiring, loyal workers.

It is with regret that we report the death of Mrs. Erik Erikson.

For all donations from individuals and companies during the entire year, the Committee is most grateful. We are deeply appreciative of the work of Miss Stilwell and her staff in the department, and for the understanding given to the Committee.

The Mary Harkness Convalescent Home Auxiliary

MRS. ROBERT C. WHEELER, *Chairman*

The Mary Harkness Convalescent Home maintains the warm link between hospitalization and normal living under the dedicated direction of Miss Miriam Hubbard, R.N. Dr. John T. Beaty, Dr. William B. Snow, Dr. Robert C. Darling and Mark Glatzer, physical therapist, continue to benefit the Home with their services.

The Country Store still supplies the patients' personal needs at a cost less than retail outlets.

Four semi-private rooms became available this summer by the conversion of two single rooms into bathrooms. Corridor bathrooms are used by fewer people, so all patients have benefited from the renovation. The added privacy has attracted more patients from private physicians.

Auxiliary members were guests of the Public Interest Department in May for a tour of the Medical Center.

The picnic grounds were enjoyed by operating room nurses; members of the Urology Department, the Medical Service, the First Columbia Division at Bellevue; student government nurses, and four local organizations. A series of field trips familiarized staff doctors and student nurses with the facilities at the Home.

Employees and friends of Mary Harkness Convalescent Home have received two issues of the new Quarterly Newsletter. The enthusiastic response was gratifying.

We appreciate the entertainment provided by the student nurses, Class of 1962; the weekly movies from the Women's Auxiliary of the New York Orthopedic Hospital; Girl Scouts from neighboring communities, local church groups and service organizations.

Christmas was celebrated by the auxiliary party with the Rye Country Day School Octet, carolers from the School of Nursing and participation by local churches. Gifts from the Auxiliary for all patients, staff and employees, were under the tree on Christmas morning. Beautiful indoor and outdoor decorations added to the holiday spirit.

New members of the Auxiliary are: Mrs. J. Brooks Hoffman, Mrs. David A. W. Wilson, Mrs. Alfred M. Vinton.

We were sorry to accept the resignation of Mrs. William M. Bristol, Jr. and our founder, Mrs. Benjamin Strong. Mrs. Strong has accepted an honorary membership.

Neurological Institute Auxiliary

MRS. H. S. FENIMORE COOPER, *Chairman*

As the outgoing chairman of this Auxiliary after five years' responsibility made both pleasant and, we hope, effective by the untiring cooperation both of our members and the various staff people with whom we have contact, it is a pleasure to report on our present position. Miss Elizabeth Prichard, head of Social Service for Medical Center, once more assisted us through the difficult period between our past and present directors. We approved her appointment of Miss Esther Shaw as director of Neurological Social Service and our confidence has been more than merited. The period of instability due to repeated staff changes is ended. I now can turn over the affairs of the Auxiliary to my successor, assured that our Social Service Department is well administered.

Our United Hospital Fund Committee is ably co-chaired by Mrs. Charles E. Adams and Mrs. Edith M. Achilles. Receipts for the year were less than expected due to the loss by death of several of our most generous contributors. However, an increase in gifts from some members of our team and the cooperation of others has made it possible for us to more than meet our quota.

The Thrift Shop Committee, still fortunate in its untiringly devoted chairman and faithful members, has had a banner year. We are most grateful to them and wish them continued success, remembering that this will depend largely on the efforts of each one of us. Toward this end we are asking each member of our auxiliary to give at least one day of service per annum in the shop itself. Our two chief interests in assigning sums we may raise are Miss Gallagher's emergency fund for special nursing, which we created and augment from time to time; and the summer camp experience for young patients from the seizure clinic.

Mrs. James C. Mackenzie reports the resignation of Mrs. T. Preston Lockwood due to protracted illness; the transfer from active to asso-

ciate membership of Mrs. William J. Murray; and the election of two new and most welcome members, Mrs. Ralph J. Cordiner and Mrs. Donald David.

In addition to regular functions, the year was highlighted by the celebration of the Fiftieth Anniversary of the Neurological Institute — a milestone in our hospital's growth and an incentive to further development. We were happy to participate and to donate \$1,000 from our own coffer. We are grateful to Mrs. Charles E. Adams, Mrs. John E. Scarff and their *ad hoc* committee for their efficient collaboration with Dr. John E. Scarff in making this a most outstanding and successful event.

Mrs. Bruce Brodie in her dual role as chairman both of Volunteers and Library, again deserves a very special word of praise. Space does not permit a detailed report of the accomplishments of each committee, which in no way lessens our appreciation of their efforts. We are confident of their continued support of our auxiliary activities.

We are proud of and appreciate our office staff members for their response to demands on their time and attention. In particular, we are indebted to Miss Marion Holland for her devotion to those cases especially referred to her. We welcome Mr. Pedro Negron back in our ranks. Under the direction of Miss Shaw we look forward to increasingly useful service both to patients and doctors.

I cannot end my tenure of office without a special word of thanks to the hospital administration that does so much to provide the pleasant atmosphere in which the auxiliaries function; also, to my vice chairman, Mrs. Sidney J. Weinberg, who has taken over my duties whenever occasion arose.

It is indeed a privilege to be associated, even in a very minor role, with such people and with a great institution dedicated to such high service.

Women's Auxiliary of the New York Orthopedic Hospital

MRS. ROBERT E. CARROLL, *Chairman*

The forethought and careful planning of Mrs. S. Hazard Gillespie, Jr., whose resignation we gratefully accepted a year ago, made it possible during 1959, for the Auxiliary to continue expanding its aid to recreational therapy and social service.

Mrs. Eva Hoffman, our recreational therapist for children, has done an outstanding job. Her interest and enthusiasm are reflected throughout the fifth floor of Babies Hospital. With the help of Mrs. John S. Tilney, chairman of the Board of Women Managers of Babies Hospital, a program was established to take our children to the roof on pleasant days during the warm months. Holiday parties, arranged by Mrs. Hoffman with professional entertainers, were rewarding and gay for our young patients.

Through the efforts of Mrs. Gillespie and Mrs. E. Allen Dennison, Mrs. Doris Lagergren joined our staff as a part time recreational therapist in the adult wards. In addition to her duties as therapist, she shows movies twice a week to ward patients. When suitable, the movies are shown to the children before being sent to Mary Harkness Convalescent Home.

At each meeting, Mrs. Delphine Wolcott, assistant director of nursing in charge of orthopedics, and her associate, Miss Hester Brown,

report on hospital activities, nursing personnel changes and overall patient comfort. Miss Vossler has been generous in providing our floor with volunteers. We are grateful to her and the many loyal persons who do so much for the well-being of the patients.

The Auxiliary gives substantial support to the Social Service Department with money raised each year for United Hospital Fund. Miss Helen Irwin and Miss Margaret Irwin accomplished an extraordinary amount of work with competence, efficiency and tact. They manage the tremendous social service work of all orthopedic clinics, report to us on cases of interest and occasionally make specific requests.

The Auxiliary also gives financial support to the Volunteer Department, the Milbank Library, the House Staff Loan Fund and scholarship aid to graduate nurses.

Two new invaluable members, Mrs. John Condliffe and Mrs. William G. Maguire, were welcomed by the Auxiliary.

As a new chairman, I am grateful for the welcome and interest of the administrative staff which is always so ready to advise and help. We look forward to another progressive and rewarding year of association with the Hospital.

Women's Auxiliary of the Presbyterian Hospital

MRS. JEROME P. WEBSTER, *Chairman*

The Auxiliary committed a budget of \$19,900 toward the support of Volunteer Service, Milbank Library and occupational therapy for the past year. In addition \$3,500 was contributed to the Resident Loan Fund; \$1,000 to the Scholarship Fund for student nurses; \$675 for a piano for the bedside broadcasting studio. Total contributions for 1959 amounted to \$32,071.

The auxiliary quota for the United Hospital Fund campaign was \$31,879. Our fund raising committee worked hard with Mrs. Paul Sheldon as chairman and, notwithstanding the loss of several large contributors, raised \$29,157. Mrs. Ralph H. Boots organized a committee of eighteen letter writers, one of the largest new groups of the campaign.

The Thrift Shop had a very successful year. On July 1, three member agencies withdrew from the shop. The increase in expenses for the remaining agencies was offset by the increase in both sales and net income.

The benefit for the Thrift Shop was repeated very successfully. In October, Mrs. Elizabeth Draper graciously gave an illustrated lecture on decorating. Tickets were paid for by articles sent to the Thrift Shop during the six months preceding the lecture. Results were most gratifying.

Further income was netted from a spring benefit house-tour of apartments at Manhattan House, which was very well attended.

The Volunteer Service achieved another record by giving substantially more hours of service than were given in any other hospital in New York City. A monthly average of 423 volunteers gave a total of 110,891 hours—an increase of eight per cent over 1958. To grow in numbers and responsibilities is difficult without larger quarters.

Two courses for Red Cross aides and two brief courses in orientation for nurses' aides were

given; with the cooperation of Miss Marjorie Peto, lectures on child care were held for teen-age volunteers. A volunteer again taught two over-subscribed Spanish language courses for hospital personnel. Constant calls for interpreters were filled, mostly for Spanish translations although several other languages were often in demand.

The groups of teen-age "candy-stripers" and Junior Red Cross volunteers have grown to 205 girls and boys from 61 schools who gave 14,360 hours of service. Eighteen students from Dodge Vocational High School, in training to become practical nurses, did their field work here, mostly in Babies Hospital or the Eye Institute.

The patients' service corps answered 11,286 requests to escort patients, deliver mail, charts and laboratory specimens.

Miss Laura Vossler, Director of Volunteers, continued her work with United Hospital Fund and American Hospital Association. The resignation of her assistant, Mrs. Eve Dyrsson, is regretted. She left to become Director of Volunteers at Roosevelt Hospital. At a tea for volunteers, 167 persons received pins for over 100 hours of service; 106 had given more than five years continuous service. United Hospital Fund also is recognizing 242 of our volunteers, fifteen of whom have given more than 4,000 hours.

The Milbank Library with 22,514 books in circulation, continued its excellent service—15,261 patients and 7,925 staff members were served—an increase of 3,519 volumes over last year. Library volunteers gave 3,044 hours which include the invaluable help of candy-stripers, especially during summer months.

New prism glasses donated by our Auxiliary were a great help to patients lying flat in bed. The glasses were used by sixty-nine patients.

During the year, a library committee was formed jointly with other auxiliaries that also

contribute to the support of the library. Mrs. Howard G. Bruenn, chairman of our library committee, was asked to be chairman. We regret to report the loss of 234 books from the library (many of them new), as compared to 188 in 1958. It is hoped the number will be materially less next year.

During 1959, Presbyterian Hospital Social Service served 16,190 patients — 2,146 more than in 1958. A total of \$19,037 was expended for care which included maintenance for 204 patients in need of temporary assistance, appliances, medication, homemakers, clothing, baby clothes, transportation, summer camps, etc. Through Mrs. Samuel Lambert and Mrs. Ralph Boots, almoners of the Havens Fund, \$1,350 was used in rehabilitation. Sixteen staff members used the Kneeland Memorial Fund which the Auxiliary provides for Social Service. It is used at the discretion of Miss Elizabeth Prichard to enable staff members to attend courses or schools of social work.

One member of the staff left for personal reasons but returned later; of two who left for other positions, one has returned.

In June, twelve students completed field training under the Social Educational Program; nine more were assigned in the Fall — eight from New York School of Social Work and one from Adelphi College. Additional students from these schools, and Fordham and New York Universities, had to be refused because of the limited supervising personnel. Miss Barbara Judkins, Educational Director, set up a program which is

receiving acclaim from schools of social work — there is a great need for good student training in hospitals of high caliber. The social service staff was stimulated by participation in the very effective medical and nursing programs and has raised the prestige of the department throughout the field of medical social work. It is interesting to note that two new experienced staff members came here to gain experience in supervision of students and in the teaching of medical and nursing students.

We are very grateful to Dr. Harold W. Brown for an illustrated talk on medical teaching at the National Taiwan University Hospital in Formosa.

The Auxiliary welcomed eight new members this year: Mrs. Howard R. Craig, Mrs. Robert J. Dellenback, Mrs. William Demorest, Mrs. Gerald DeVoe, Mrs. James Malm, Mrs. Carl Truman Nelson, Mrs. Calvin Plimpton and Mrs. W. Duane Todd. Four resignations were accepted with much regret: Mrs. David C. Bull, Mrs. George E. Daniels, Mrs. Sidney Fibel and Mrs. Hazard Gillespie, Jr. Two active members transferred to associate membership: Mrs. Walton P. Kingsley and Mrs. Dana T. Bartholomew, our very valuable vice chairman, who, the Auxiliary regrets, is moving to Montreal.

It is not possible to enumerate the many personal services of our active members, or to thank the committee chairmen who have carried the burden of the year's work. The Auxiliary is very admiring of the labors of love they have given the Hospital in their many activities.

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 Williams, Mrs. Jean
 Williamson, Mrs. Nora
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 Winant, Miss Florence
 Wing, Mr. Herbert
 Wolf, Mrs. Lillian
 Wolff, Miss Frieda
 Woods, Miss Darlene
 Worden, Mrs. Alma
 Woythaler, Miss Eva
 Young, Miss Ellen
 Young, Mrs. Marie
 Zarganis, Mrs. Olga
 Zografi, Mrs. Parasugeya

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VISITING FELLOW

Claude Dupont, M.D.

RESIDENTS — THORACIC SURGERY

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 John A. Malcolm, M.D.

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 Tirso C. Bursian, M.D.
 J. Claude Gaulin, M.D.

Lewis A. Johnson, M.D.
 William H. Loery, M.D.

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Urology

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 Hans H. Zinsser, M.D.

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 Archie L. Dean, Jr., M.D.
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 Robert R. White, III, M.D.
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 Paul Francis Crutchlow, M.D.
 Frederick S. Dick, M.D.
 Clement A. Furey, M.D.
 Philip B. Jensen, M.D.
 C. Dudley Miller, M.D.
 Murray B. Pincus, M.D.
 Michael James Pirozzi, M.D.
 Stanford Pulrang, M.D.
 Arthur T. Willetts, M.D.

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Robert B. Ambrose, M.D.
 Ralph L. Gentile, M.D.
 John H. Hobart, M.D.
 Martin F. Ill, M.D.
 Paul A. Kennedy, M.D.
 Sam T. Knappenberger, M.D.
 Frank W. Longo, M.D.
 Frederick S. Marshall, M.D.
 Morey Wosnitzer, M.D.

VISITING FELLOWS

Leon I. Bernstein-Hahn, M.D.
 Michael W. Justice, M.D.

Chiefs of Clinics

Dr. Ernest Salanitre *Anesthesiology*
 Dr. J. Lowry Miller *Dermatology*
 Dr. Albert R. Lamb, Jr. *Medicine (Group Clinic)*
 Dr. John E. Scarff *Neurological Surgery*
 Dr. Daniel Sciarra *Neurology*
 Dr. C. Paul O'Connell *Obstetrics and Gynecology*
 Dr. Maynard C. Wheeler *Ophthalmology*

Dr. Halford Hallock *Orthopedic Surgery*
 Dr. Franz Altmann *Otolaryngology*
 Dr. William A. Bauman *Pediatrics*
 Dr. Morton Hoberman *Physical Medicine*
 Dr. Roger MacKinnon *Psychiatry*
 Dr. Edward B. Self *Surgery*
 Dr. Ralph J. Veenema *Urology*

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Appendix



Appendix

STATISTICS

December 31, 1959

BED COMPLEMENT

PRIVATE:	No. Beds	WARD:	No. Beds
Presbyterian Hospital (Harkness Pavilion)	203	Presbyterian Hospital and Sloane Hospital:	
Babies Hospital	3	Medicine	102
Institute of Ophthalmology.....	19	Dermatology	8
Neurological Institute	48	Metabolism	10
Sloane Hospital	23	Surgery	114
Total Private	296	Urology	36
		Orthopedic	67
		Otolaryngology	12
		Admitting	14
		Gynecology	35
		Obstetrics	81
		Babies Hospital (including premature nursery of 23 incubators).....	152
		Institute of Ophthalmology.....	37
		Neurological Institute	104
		Total Ward	772
			1,463
		MARY HARKNESS CONVALESCENT HOME	33
			1,496
		NEWBORNS (Sloane Hospital).....	113
		Total	1,609
SEMI-PRIVATE:			
Presbyterian Hospital and Sloane Hospital:			
All Services (Harkness Pavilion)	97		
Medicine	9		
Surgery	14		
Urology	31		
Orthopedic	55		
Otolaryngology	21		
Gynecology	13		
Obstetrics	29		
Babies Hospital	41		
Institute of Ophthalmology.....	36		
Neurological Institute	49		
Total Semi-Private	395		

HOSPITAL ADMISSIONS

	Admissions			Admissions	
	1959	1958		1959	1958
PRIVATE:			WARD:		
Presbyterian Hospital (Harkness Pavilion)	5,656	5,428	Presbyterian Hospital and Sloane Hospital:		
Babies Hospital	269	298	Medicine	1,625	1,543
Institute of Ophthalmology.....	659	604	Dermatology	110	111
Neurological Institute	924	885	Metabolism	137	106
Sloane Hospital	861	810	Surgery	2,063	1,828
Total Private	8,369	8,025	Urology	666	690
			Orthopedic	1,119	1,099
SEMI-PRIVATE:			Otolaryngology	478	421
Presbyterian Hospital and Sloane Hospital:			Admitting	1,049	1,231
All Services (Harkness Pavilion)	2,965	2,942	Gynecology	895	915
Medicine	184	164	Obstetrics	4,359	4,674
Surgery	339	326	Babies Hospital	2,894	2,941
Urology	675	687	Institute of Ophthalmology.....	1,034	887
Orthopedic	936	990	Neurological Institute	1,162	1,182
Otolaryngology	1,207	1,260	Total Ward	17,591	17,628
Gynecology	585	608	MARY HARKNESS CONVALESCENT HOME	643	692
Obstetrics	1,023	1,001	Total	39,136	38,808
Babies Hospital	2,000	1,850			
Institute of Ophthalmology.....	1,519	1,485	INFANTS BORN IN SLOANE HOSPITAL:		
Neurological Institute	1,100	1,150	Private beds	650	584
Total Semi-Private	12,533	12,463	Semi-private and Ward beds.....	3,732	3,868
			Total	4,382	4,452

HOSPITAL OCCUPANCY

	<i>Patient Days Care</i>		<i>Percentage of Occupancy</i>	
	<i>1959</i>	<i>1958</i>	<i>1959</i>	<i>1958</i>
PRIVATE:				
Presbyterian Hospital (Harkness Pavilion).....	70,732	70,839	95.5	95.6
Babies Hospital	792	1,235	72.3	53.6
Institute of Ophthalmology.....	6,053	5,723	87.3	82.5
Neurological Institute	15,398	15,259	87.9	87.1
Sloane Hospital	6,077	5,845	72.4	69.6
Total Private	<u>99,052</u>	<u>98,901</u>	<u>91.7</u>	<u>90.5</u>
SEMI-PRIVATE:				
Presbyterian Hospital and Sloane Hospital:				
All Services (Harkness Pavilion).....	30,143	29,653	85.1	83.8
Medicine	2,997	3,165	91.2	96.3
Surgery	5,051	4,959	98.8	97.0
Urology	8,331	8,103	73.6	71.6
Orthopedic	14,215	15,923	70.8	79.3
Otolaryngology	5,429	5,470	70.8	71.4
Gynecology	5,560	5,536	117.2	116.7
Obstetrics	6,773	6,471	64.0	61.1
Babies Hospital	14,137	13,337	94.5	102.1
Institute of Ophthalmology.....	12,576	12,268	95.7	93.4
Neurological Institute	18,286	16,381	102.2	101.8
Total Semi-Private	<u>123,498</u>	<u>121,266</u>	<u>85.7</u>	<u>86.3</u>
WARD:				
Presbyterian Hospital and Sloane Hospital:				
Medicine	33,177	32,788	89.1	88.1
Dermatology	2,561	2,666	87.7	91.3
Metabolism	2,462	2,300	67.5	63.0
Surgery	35,184	34,409	84.6	82.7
Urology	11,799	11,193	89.8	85.2
Orthopedic	20,756	20,600	84.9	84.2
Otolaryngology	3,154	2,840	72.0	64.8
Admitting	2,436	2,774	47.7	54.3
Gynecology	10,794	11,706	84.5	91.6
Obstetrics	27,645	27,945	93.5	94.5
Babies Hospital	43,063	43,426	77.6	78.6
Institute of Ophthalmology.....	8,696	8,103	64.4	60.0
Neurological Institute	26,117	27,889	68.8	70.2
Total Ward	<u>227,844</u>	<u>228,639</u>	<u>80.9</u>	<u>80.7</u>
MARY HARKNESS CONVALESCENT HOME.....	10,631	13,112	86.1	80.1
Total	<u>461,025</u>	<u>461,918</u>	<u>84.4</u>	<u>84.1</u>
INFANTS BORN IN SLOANE HOSPITAL:				
Private beds	4,594	4,418	54.7	52.6
Semi-private and Ward beds.....	22,588	23,348	68.8	71.1
Total	<u>27,182</u>	<u>27,766</u>	<u>65.9</u>	<u>67.3</u>

OUT-PATIENT DEPARTMENT STATISTICS

	1959	1958
Summary of Patients Treated:		
Number of patients treated.....	66,699	59,571
Number of visits:		
Free	110,563	112,454
Pay	310,901	290,907
Total	421,464	403,361
Average visits per working day.....	1,653	1,588

	New to Clinics	Revisits	Total Visits
Attendance Statistics:			
Dermatology	6,972	25,026	31,998
Emergency and Admitting Wards.....	23,194	6,295	29,489
Group Clinic	3,669	23,237	26,906
Medicine	4,338	37,237	41,575
Neurology	3,124	14,937	18,061
Obstetrics and Gynecology.....	6,133	36,397	42,530
Occupational Therapy	91	1,089	1,180
Ophthalmology	4,677	24,331	29,008
Orthopedic	13,373	27,533	40,906
Otolaryngology	4,583	14,378	18,961
Pediatrics	7,300	43,213	50,513
Physical Therapy	1,347	15,952	17,299
Psychiatry	1,032	5,951	6,983
Surgery	26,262	29,140	55,402
Urology	1,625	9,028	10,653
Total	107,720	313,744	421,464

PERSONNEL STATISTICS

	On Duty December 31	
	1959	1958
Administration	12	13
Assistant Secretary-Treasurer	44	49
Comptroller	100	91
Public Interest	11	14
Convalescent Home	32	31
Non-professional services:		
Buildings and Grounds.....	591	595
Food Service	382	375
Personnel and Protective.....	79	75
Other non-professional services.....	181	176
Professional services:		
Nursing	1,269	1,243
Professional Staff, Doctors' Offices & Research.....	392	394
Special Services	470	451
Vanderbilt Clinic and other.....	264	247
Total	3,827	3,754
Student Nurses	394	449
Volunteer Workers	460	412

REPORTS OF THE TREASURERS
THE ALUMNAE ASSOCIATION OF THE
SCHOOL OF NURSING OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK

BALANCE SHEET

December 31, 1959 and 1958

ASSETS

	<u>1959</u>	<u>1958</u>
Capital Funds — securities and cash.....	\$781,830.12	\$742,752.31
Operating Funds — securities, cash, etc.....	10,510.99	12,262.59
Total Assets	<u>\$792,341.11</u>	<u>\$755,014.90</u>

LIABILITIES

Capital Fund Reserves:		
General fund	\$ 17,808.20	\$ 14,146.81
Benefit fund	159,719.18	154,566.96
Pension fund	534,013.86	510,435.81
Scholarship funds:		
M. Elizabeth Deans Howell fund.....	502.84	
Emma B. Kennedy fund.....	26,785.05	25,610.46
Memorial fund, '20.....	2,528.09	2,411.90
June Moore fund.....	400.00	
Richard William Walsh fund.....	2,085.60	1,822.94
Ruth C. Williams fund.....	2,664.75	2,199.56
Helen Young fund.....	35,322.55	31,557.87
Total capital fund reserves.....	<u>\$781,830.12</u>	<u>\$742,752.31</u>
Operating Funds Reserve.....	<u>\$ 10,510.99</u>	<u>\$ 12,262.59</u>
Total Liabilities	<u>\$792,341.11</u>	<u>\$755,014.90</u>

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

Cash on hand January 1.....	\$ 10,321.34	\$ 7,023.78
Receipts:		
Sale of securities.....	\$ 25,197.17	\$124,897.48
Investment income	41,721.85	39,024.37
Donations	14,162.98	9,248.72
Dues and initiation fees.....	10,353.66	10,392.66
Dinner to graduating class.....	347.00	243.00
Loans repaid, etc.....	1,487.35	1,195.78
Total Receipts	<u>\$ 93,270.01</u>	<u>\$185,002.01</u>
	<u>\$103,591.35</u>	<u>\$192,025.79</u>
Disbursements:		
Purchase of securities.....	\$ 62,046.25	\$147,648.87
Clerical expense and fees.....	5,794.00	5,529.30
Pensions and benefits paid.....	15,248.00	14,710.00
Scholarships granted	2,400.00	2,250.00
Loans granted		300.00
Donations	187.50	100.00
Printing, stationery and postage.....	7,361.78	7,209.41
Entertainment of graduating class.....	2,312.64	1,956.92
Miscellaneous	2,105.37	1,999.95
Total Disbursements	<u>\$ 97,455.54</u>	<u>\$181,704.45</u>
Cash on hand December 31.....	<u>\$ 6,135.81</u>	<u>\$ 10,321.34</u>

HELEN YOUNG, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

FOR THE AUXILIARY

For the Years 1959 and 1958

	1959	1958
Balance, January 1.....	\$ 4,288.18	\$ 19.27
Receipts:		
Membership dues	\$ 530.00	\$ 470.00
Donations	50.00	6,384.38
United Hospital Fund:		
Free Care Distribution	4,252.53	5,088.74
Direct Benefit	5,787.00	4,157.00
Greater New York Fund.....	7,197.47	5,803.89
Total Receipts	<u>\$17,817.00</u>	<u>\$21,904.01</u>
	<u>\$22,105.18</u>	<u>\$21,923.28</u>
Disbursements:		
To Babies Hospital for:		
Care of Ward and Clinic Patients.....	\$ 5,787.00	\$ 4,157.00
Emergency Nursing	5,500.00	5,000.00
Pediatric Psychiatric Clinic.....	1,500.00	1,500.00
Recreational Therapy	4,500.00	4,500.00
Volunteer service	500.00	500.00
House Staff Loan Fund.....	1,500.00	1,500.00
Hospital Appeal Booklet.....		200.00
Decorations, furniture and equipment, etc.....	250.00	250.00
Miscellaneous	29.00	28.10
Total Disbursements	<u>\$19,566.00</u>	<u>\$17,635.10</u>
Balance, December 31.....	<u>\$ 2,539.18</u>	<u>\$ 4,288.18</u>

MARY S. B. BRAGA, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

FOR THE CRIBSIDE SOCIAL SERVICE COMMITTEE

For the Years 1959 and 1958

	<u>1959</u>	<u>1958</u>
Balance, January 1.....	\$12,662.95	\$18,674.31
Receipts:		
Membership dues	\$ 265.00	\$ 235.00
Donations	140.00	41.00
United Hospital Fund.....	6,192.73	7,130.58
Greater New York Fund.....	9,804.27	8,132.69
Investment income	671.28	661.58
Bargain Box Thrift Shop.....	7,324.93	7,332.10
Sewing Class dues and receipts.....	345.17	419.48
Repayment by patients of advances and loans.....	351.00	390.50
Total Receipts	<u>\$25,094.38</u>	<u>\$24,342.93</u>
	<u>\$37,757.33</u>	<u>\$43,017.24</u>
Disbursements:		
Social service salaries.....	\$24,483.54	\$21,702.97
Travel of social service staff.....	103.68	110.12
Conference expenses, dues, subscriptions and meetings.....	37.00	226.08
Camping for handicapped children (Convalescent care 1958).....	807.15	888.13
Advances to patients for convalescent care and miscellaneous loans.....	351.00	390.50
Relief assistance and extra for patients:		
Clothing	1,166.66	1,106.61
Milk and food.....	411.02	74.00
Christmas and Thanksgiving.....	308.46	397.52
Other	134.30	145.81
To Babies Hospital for:		
Emergency Nursing		5,000.00
Social Service Scholarships.....	2,300.00	
Hospital Appeal Booklet.....		200.00
Miscellaneous	6.49	112.55
Total Disbursements	<u>\$30,109.30</u>	<u>\$30,354.29</u>
Balance, December 31.....	<u>\$ 7,648.03</u>	<u>\$12,662.95</u>

EDITH FENNELLY, *Chairman*

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1959 and 1958

	1959	1958
Balance, January 1.....	\$12,342.42	\$19,847.99
Receipts:		
Membership dues	\$ 335.00	\$ 345.00
Donations	1,400.00	1,110.00
United Hospital Fund:		
Free Care Distribution	8,949.09	10,963.89
Direct Benefit	7,243.00	4,448.00
Greater New York Fund.....	15,139.91	12,504.71
Everybody's Thrift Shop.....	14,692.05	9,442.76
Repayments by patients of advances and loans.....	536.82	525.75
Total Receipts	\$48,295.87	\$39,340.11
	\$60,638.29	\$59,188.10
Disbursements:		
Social service salaries.....	\$24,062.55	\$21,860.83
To Neurological Institute for:		
Care of Ward and Clinic Patients.....	7,243.00	4,448.00
Library	2,498.80	2,095.79
Special Nursing Fund.....	2,500.00	5,000.00
Hospital Appeal Booklet.....		100.00
Volunteer service	1,900.00	1,900.00
Fiftieth Anniversary		1,000.00
Advances to patients for summer therapeutic care and miscellaneous.....	536.82	525.75
Summer therapeutic care.....	2,458.00	2,620.00
Chronic care	869.51	1,980.86
Convalescent care	94.23	568.40
Medical relief	3,441.76	3,880.03
Staff travel, field and conference.....	20.56	33.78
Miscellaneous, postage, telephone and publications.....	726.61	832.24
Total Disbursements	\$46,351.84	\$46,845.68
Balance, December 31.....	\$14,286.45	\$12,342.42

KATHERINE G. FENIMORE COOPER, *Chairman*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS
 For the Years 1959 and 1958

	<u>1959</u>	<u>1958</u>
Balance, January 1.....	\$15,901.72	\$16,802.71
Receipts:		
Donations	\$14,308.38	\$ 2,513.42
United Hospital Fund Direct Benefit.....	13,558.00	7,945.00
Allocation from United Hospital Fund and Greater New York Fund		
Distribution	4,000.00	4,000.00
Total Receipts	\$31,866.38	\$14,458.42
	<u>\$47,768.10</u>	<u>\$31,261.13</u>
Disbursements:		
Recreational therapist salary.....	\$ 5,822.52	\$ 3,734.69
Other recreational therapy expenses.....	992.14	1,128.22
To Presbyterian Hospital for:		
Care of Ward and Clinic Patients.....	13,558.00	7,945.00
House Staff Loan Fund.....	1,000.00	
Library	1,132.92	998.60
Volunteer service	1,100.00	1,100.00
Hospital Appeal Booklet.....		100.00
Scholarship Aid for Graduate Nurses.....	500.00	
Miscellaneous	366.73	352.90
Total Disbursements	\$24,472.31	\$15,359.41
Balance, December 31.....	<u>\$23,295.79</u>	<u>\$15,901.72</u>

VIRGINIA S. HUTTON, *Treasurer*

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS
 For the Years 1959 and 1958

	<u>1959</u>	<u>1958</u>
Balance, January 1.....	\$ 4,003.21	\$ 4,830.18
Receipts:		
Membership dues	\$ 697.50	\$ 670.00
United Hospital Fund:		
Free Care Distribution.....	5,727.36	6,890.78
Direct Benefit	6,731.00	6,580.00
Greater New York Fund.....	9,693.64	7,859.18
Donations	65.00	966.00
Stuyvesant Square Thrift Shop.....	6,704.32	6,272.22
Other (Manhattan House Tour Benefit).....	2,098.17	
Total Receipts	<u>\$31,716.99</u>	<u>\$29,238.18</u>
	<u>\$35,720.20</u>	<u>\$34,068.36</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic Patients.....	\$ 6,731.00	\$ 6,580.00
Occupational Therapy	6,000.00	6,000.00
House Staff Loan Fund.....	3,500.00	913.50
Library	6,964.85	6,621.99
Social Service Development Fund.....		900.00
Scholarship Aid to Student Nurses.....	1,000.00	600.00
Hospital Appeal Booklet.....		100.00
Volunteer service	7,200.00	7,200.00
Miscellaneous	954.84	1,149.66
Total Disbursements	<u>\$32,350.69</u>	<u>\$30,065.15</u>
Balance, December 31.....	<u>\$ 3,369.51</u>	<u>\$ 4,003.21</u>

NANCY V. BARRETT, *Treasurer*

Endowed Beds

(1) A gift of \$10,000 shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special service) for not more than ninety days in any one year.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment, and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objects for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as a permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the Executive Vice President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and Executive Vice President of the Hospital) at the time the nomination is made.

Endowed Beds and Rooms

Presbyterian Hospital

- 1868 Mary J. Gelston
- 1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore
- 1871 John Laurie
Mary Ann Parish
- 1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhinelander
- 1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York
- 1884 Nathaniel W. Conkling
West Presbyterian Church, to be known as
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane
- 1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin
- 1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Edward L. Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother,
Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
O. B. Jennings

- Mrs. John Stewart Kennedy
Amelia Kerr
Robert Marshall
Elizabeth S. and Emily M. Wheeler, in memory of
James Boorman
"The Davenport Bed"
- 1891 Sarah A. Havemeyer, in memory of her son,
Hector C. Havemeyer
Thomas Hope
John E. Parsons, in memory of his children,
E. L. P., K. M. P., and R. M. P.
Mrs. A. R. Van Nest, in memory of her husband,
Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
Emma Stewart Baker
Alexander Maitland, in memory of his mother,
Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
Edgar S. Auchincloss
Frances T. Lord, in memory of her husband,
George deForest Lord
Presbyterian Church on University Place
Presbyterian Home for Aged Women
Margaret A. Sinclair, in memory of
Mr. and Mrs. James Sinclair
West-Park Presbyterian Church
Young Men's Christian Association
- 1895 Mary Harrison
Mrs. Clarence M. Hyde, in memory of her mother,
Rebecca Babbitt
John Stewart Kennedy, in memory of
Mrs. Robert L. Stewart
Mrs. James T. Murray, in memory of her husband,
James T. Murray
- 1896 Anthony Dey, in memory of Joseph G.
and Eliza D. Scott
Jane Hope
Esther J. Jennings, in memory of her husband,
Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
James Rich Steers
William S. Brown
Helen Miller Gould, in memory of her parents,
Mr. and Mrs. Jay Gould
Margarette E. and Susan D. Griffith, in memory of
their father, Griffith W. Griffith
Mary J. Griffith, in memory of her husband,
Griffith W. Griffith
Rachel L. Kennedy, in memory of her mother,
Mrs. Rachel C. Kennedy
Annie S. Paton, in memory of her husband,
William Paton
Charlotte H. Skidmore, to be known as
"The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
Matilda A. Brown, in memory of her son,
H. Auchincloss Brown
First Presbyterian Church
Mrs. Stephen V. Harkness, in memory of her
daughter, Florence Harkness
Jane Hope, in memory of her mother,
Grace Corrie Hope
- John Stewart Kennedy, in memory of
Rev. William G. Schauffler, D.D., LL.D.
Mrs. Elliott F. Shepard, in memory of her
daughter, Florence Vanderbilt Shepard
Mrs. Elliott F. Shepard, in memory of her
daughter, Marguerite Shepard
- 1899 William W. Cole, in memory of his mother,
Mary A. Cole
William Whitewright, in memory of his father,
William Whitewright, "The Whitewright Beds"
(10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
Moses Hopkins, "Moses Hopkins Memorial"
Donald MacKay, in memory of his children,
Edith Winslow and Walter Wise MacKay
Caroline L. Macy, in memory of her daughter,
Mary M. K. Willets
Laura Roome, in memory of her sons,
Harry and Alfred Roome
Martha L. St. John, in memory of her mother,
Sarah Ward
Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
Frederick Billings
Camilla L. Edwards, in memory of her husband,
Walter Edwards
Andrew J. Garvey, in memory of his mother,
Elizabeth Jeffries Garvey (2 Beds)
George Lauder
Charles H. Marshall
Justine Adele Stafford, in memory of her father,
Justin A. Bliss
- 1902 Robert Graham Dun
Margaret J. Plant, in memory of her brother,
Simon Loughman
- 1903 Heber R. Bishop
Lura Currier
Mrs. Francis B. Harrison
Julia J. MacCartee, in memory of her husband,
Robert MacCartee
Madison Avenue Reformed Church
Adele Berry Sloane, in memory of her father,
Abraham J. Berry, M.D.
Justine Adele Stafford, in memory of her mother,
Eveline C. Bliss
John T. Terry
- 1904 Virginia E. Fowler, in memory of
Clarence E. Fowler
Susan Bevier
Mrs. William Starr Miller
Josephine Penford, in memory of
Dr. Edward Livingston Trudeau, Jr.
Peter Reid, in memory of his wife,
Jane Watson Reid
Francis A. Palmer
- 1905 Frederick G. Bourne
Helen C. Inslee, in memory of her husband,
Samuel Inslee
Titus B. Meigs, in memory of his son,
Titus B. Meigs, Jr.
Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place

- 1906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
Susan W. Duncan, in memory of her husband,
John P. Duncan
Samuel Keyser (3 Beds)
Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
Reformed Protestant Dutch Church of
Garden Street
John Sloane, in memory of his brother,
Thomas Chalmers Sloane
John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
Samuel Anthony Goldschmidt, in memory of
his mother, Celestine Goldschmidt
Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory of
"Minnie and Willie"
Canadian Society of New York
Edward West Currier, in memory of his
stepmother, Laura Currier
Edward West Currier, in memory of his
stepbrother, Walter B. Currier
Edward West Currier, in memory of
Edward W. Currier
Mary Jane Johnson, in memory of her husband,
William H. Johnson
J. Theresa Keyser, in memory of her husband,
Samuel Keyser
Julia Hannon Lyle
Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
Jane A. Townsend, in memory of her son,
Harmon W. Norton
Jane A. Townsend, in memory of her daughter,
Emma L. Norton
Amelia Mott Graham, in memory of
Malcolm Graham
Adeline Ives Latham, in memory of her husband,
John Howard Latham
Josephine G. Lord, in memory of her husband,
Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck,
"Madam Beck Memorial Teacher's Bed"
Harriet Coles, in memory of her sisters,
Susan and Anna Codman
Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
Reformed Low Dutch Church of Harlem
Frederick Sturges, in memory of his father,
Jonathan Sturges
William Stuart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in Children's Ward,
"Emma de Wolf Bed"
Gustavia A. Senff, in memory of her husband,
Charles A. Senff
Mrs. Christopher M. Bell, "The Dennistoun Bed"
Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpentier Memorial" (3 Beds)
Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
Josephine Penfold
Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
William H. Penfold, in memory of
Josephine Penfold
Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
Minnie Hackett Trowbridge (6 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
A Friend
Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
Central Presbyterian Church
Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "Chalmers
Memorial Bed"
Robert A. Chambers, in memory of his father,
Robert Chambers
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Sarah C. Miller
Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as
"Leora McCammon Bed"
- 1919 Samuel Elliott
Elizabeth Keys, in memory of her daughter,
Edith Keys
Rutgers Presbyterian Church
James R. Steers, in memory of his former wife,
Rebecca E. Steers
John W. Sterling
- 1920 William C. Boschen, to be known as the
"Boschen Bed"
Rosa Franklin (4 Beds)

- Francis P. Furnald
Mrs. Francis P. Furnald
Mary A. Harriot, to be known as the
"Margaret Harriot Alms"
Mary A. Harriot, to be known as the
"James Harriot Alms"
Mrs. Henry O. Havemeyer, in memory of her
parents, George William and Matilda Adelaide
Elder
Margaret J. Orr, in memory of her mother,
Ann Boyd Orr
Anna St. John, in memory of her brother,
Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the
"Sidney Dillon Bed"
Henry M. Gescheidt
Ralph E. Prime, in memory of his daughter,
Ruth Havens Prime
Joseph K. Gwynn
Charles S. Ward, in memory of his friend,
Sophie L. Kinman
Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
Christina C. Munro, in memory of her husband,
John Munro
Anna M. Romaine, in memory of
Dr. William I. Detmold
Arnold Thayer (2 Beds)
Hamilton B. Tompkins, in memory of his wife
and himself
- 1923 Lydia Augusta Brown
Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
Cordelia F. Turrell
Nannie Gyles Johnson (Children's Ward),
in memory of her son, Shirley Everton Johnson
Mrs. William John Fitzgerald
- 1925 Christina Bond
In memory of Julia C. Skidmore
George Clarke
Elizabeth J. Hofer (2 Beds)
In memory of Catherine Parke and
Horatio C. Kretchmar
Edward M. Morgan Memorial Association
(4 Beds)
In memory of Edward M. Morgan
Jennette Robertson, to be known as
"Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as
"E. E. Auchincloss, Jr. Bed"
Members of the New York Stock Exchange,
to be known as the "Seymour LeGrande
Cromwell Memorial" (2 Beds)
Edmund Penfold, in memory of
Josephine Penfold and William Hall Penfold
(2 beds)
Dr. M. Allen Starr, in memory of
Allen Egbert Starr
John B. Trevor, in memory of Emily N. Trevor
West End Collegiate Church
George D. Widener
- 1927 Second Presbyterian Church in the
City of New York
Ellen Mills Borne, in the Children's Ward,
to be known as "John E. Borne Bed" and
"Nellie M. Borne Bed" (2 beds)
Virginia Marquand Monroe, in the name of the
Young Men's Christian Association
Mrs. Charles H. Senff, to be known as
"Dr. George A. Tuttle Bed"
W. Frazer Gibson, in memory of his mother,
Jeanette Frazer Gibson, to be known as
"Jeanette Frazer Gibson Bed"
Augustus C. Gurnee, in memory of his mother,
Mary M. Gurnee (2 beds)
Eliza V. Nicholson
Mrs. Murray W. Dodge and Mrs. Franklin Lord,
in memory of their mother,
Mrs. Fordyce D. Barker (Single Ward Room)
Dunlevy Milbank (Single Ward Room)
F. Ethel Wickham, in memory of her father,
William Hull Wickham, to be known as "William
Hull Wickham Bed" (Single Ward Room)
Anna A. Johnston, in memory of her parents,
William G. and Adriana C. Gardner
Anna A. Johnston, in memory of Lewis, Anna,
Edward and Mary Johnston (Single
Ward Room)
Broadway Presbyterian Church, to be known as
the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
In memory of McKevers Bayard Brown
(Single Ward Room)
Caroline B. Sellew (4 Beds)
Red Cross Rooms for Nurses
(3 Single Ward Rooms)
Robert W. deForest (Single Ward Room)
Henry W. deForest (Single Ward Room)
James R. Steers
Jane Livingston Armour, in memory of
John A. Livingston
Jane Livingston Armour, in memory of
Herman O. Armour
In memory of Meredith Howland Pyne
Stella C. and Roi C. Megrue (Single Ward Room)
Mrs. E. C. Wills, in memory of her mother,
Mrs. J. F. Ackerman, and her sister,
Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister,
Eliza W. White
Elizabeth A. Hays, in memory of William and
Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
The Presbyterian Church in the Town of
Rye, N. Y.
Mrs. Arthur E. Lauderbach, in memory of her
mother and father, Esther Hull Jackson and
Peter A. H. Jackson
Mary L. Walker Peters, to be known as "The
Charles Grenville Peters and Mary Walker
Peters Free Bed"
Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of Adolph
Obrig and Clara Beales Obrig (Single Ward
Room)
Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole

- 1932 In loving memory of Justine Adele Stafford (Mrs. W. F. Stafford) by her sister, Ida Evelina Bliss
 - 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance, in memory of James R. Jesup
 - 1934 Ida Adams, in memory of her sister, Sadie E. and her brother, Robert F. Adams (Single Ward Room)
Josephine Leypoldt, in memory of her brothers, Louis and Frederick Leypoldt (2 Beds)
 - 1935 Walter J. M. Donovan, in memory of his father, Timothy Donovan
 - 1936 Elizabeth P. Hewes, to be known as "The Elizabeth P. Hewes Bed"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
Mary S. Thayer, to be known as "The Orlando Thayer Bed"
 - 1937 Margaretta J. Gamble, to be known as "The Gamble Bed," in memory of her father and mother
Jeremiah Milbank, in memory of his father, the late Joseph Milbank
 - 1938 Susetta L. Goss, to be known as "The Goss Bed," in memory of her parents, Rev. C. C. Goss and Theodosia C. Goss
Annie Miller, to be known as "The Mrs. Alexander Miller Memorial Bed," in memory of her mother, Mrs. Alexander Miller
Bertha H. Minturn, in memory of her most faithful and beloved nurse, Mary Humphries
Henry T. Sloane, to be known as "The Euphemia Sloane Coffin Bed," in memory of his sister, Euphemia Sloane Coffin
 - 1939 "In Memoriam"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
 - 1940 George Gibbs, to be known as "The George Gibbs Bed"
 - 1942 Mrs. Huntington McLane, to be known as the "Therese K. Thorne Bed," in memory of her mother
Cornelia Livingston Pell, in memory of Alfred Duane Pell
Frank Wallach, in memory of Ida May Wallach
 - 1943 Stuart Duncan, to be known as "The Stuart Duncan Bed"
 - 1944 Anonymous, to be known as "The Dr. William Darrach Bed"
John Fraser, in memory of his parents, Alexander and Elizabeth Fraser
 - 1945 Robert W. Carle, in memory of his mother, to be known as the "Cornelia Willets Carle Bed" for general hospital use including harelip and cleft palate cases
 - 1947 W. and J. Sloane
Frederick Sturges, Jr., Mrs. Mary Armit Sturges, Mrs. Catharine Armit Chapman and Frederick Sturges, III, in memory of Frederick Sturges
Walter S. Gifford, in memory of his son, Walter Sherman Gifford, Jr.
Ida L. Darling, known as the "Richards Memorial Bed"
 - John Sloane, in memory of his wife, Elsie Nicoll Sloane, to be known as the "Elsie Nicoll Sloane Bed"
 - Elisa Smith Mabon, in memory of her husband, James Brown Mabon
 - 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
 - 1949 Effie B. Shearman
 - 1950 Isabel Shields Kemp, to be known as "Mary M. Shields and the Dr. Robert Coleman Kemp Free Bed"
 - 1951 Gerrish Hill Milliken
 - 1952 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
 - 1953 Estate of Charlotte C. Garretson, to be known as the "Charlotte Higbee Kelsey Bed"
W. Alton Jones Foundation, Inc., to be known as the "Nettie Marie Jones Bed"
 - 1954 Estate of M. Samuel Stern, to be known as the "M. Samuel Stern Memorial"
 - 1955 Estate of Robert J. Eidlitz to be known as the "Marc Eidlitz Bed"
Mrs. John S. Holbrook, in memory of her parents, John Johnston and Mary Sloane Sinclair
 - 1956 Estate of Aurie Dell Black to be known as the "Aurie Dell Black Bed"
Robert W. Carle to be known as the "Adele Skiddy Carle Bed"
Estate of Adolph Riesenberg to be known as "The Adolph and Anna A. Riesenberg Bed"
 - 1957 George F. Cahill, M.D., to be known as the "Endowed Bed for Personnel of the Squier Urological Clinic"
Edward H. Carle, in memory of his father, to be known as the "John J. Carle Bed"
Mrs. William J. Demorest, in memory of her parents, Wealthy H. Lewis and Richard James Lewis
Chancellor Kent Lodge 870, Free and Accepted Masons, in memory of George J. Weissman
Morris Morgenstern Foundation, to be known as the "Sadie B. Morgenstern Bed"
Estate of Mary Ross Potter, to be known as the "Georgianna Morley Bed"
Estate of Mathilde S. Sterne, to be known as the "Simon Sterne Beds" (3 Beds)
Board of Trustees of The Presbyterian Hospital in honor of and to be known as the "Charles P. Cooper Endowed Bed"
 - 1958 Mrs. Robert W. Carle, to be known as the "Robert W. Carle Bed"
 - 1959 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
Mrs. Stanley G. Mortimer, to be known as the "Stanley G. Mortimer Bed," in memory of her husband
Mrs. John S. Thacher, to be known as the "Alice E. Baker Bed," in memory of her mother
- MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES
- 1948 Mrs. William Barclay Parsons, in memory of her husband, William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be known as the "Muriel Jane Rudinger Bed"

- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
 1952 John F. Bush Memorial Bed
 Estate of Selma Boyd, each to be known as a
 "Boyd Bed" (2 beds)
 Bruce Barton, in memory of his wife, to be known
 as the "Esther Randall Barton Memorial Bed"
 1953 Herman Goldman Foundation, Inc., in memory of
 Theresa and Frank Goldman
 W. Alton Jones Foundation, Inc., in memory of
 Mamie W. Marvin
 1954 Mr. and Mrs. Charles P. Cooper, in memory of
 Mrs. Cooper's father, Doctor Charles
 Lathrop Parsons
 John Shepard Parke Memorial Bed
 Mr. and Mrs. Sidney J. Weinberg, in memory of
 their parents
 1955 Bruce Barton, in memory of Clyde Scott and
 Helen Barton Stilwell, to be known as the
 "Clyde Scott and Helen Barton Stilwell
 Memorial Bed"
 George F. Cahill, M.D., Research bed in the
 Department of Urology
 Mr. and Mrs. Charles P. Cooper, in memory of
 Mrs. Cooper's mother, Mrs. Charles Lathrop
 Parsons
 Herman Goldman Foundation, Inc., in memory of
 Theresa and Frank Goldman
 Williams-Adler Foundation Bed
 1959 "John Shepard Parke Memorial Bed"

ENDOWED ROOMS

- 1903 Henry H. Rogers
 1905 Mrs. Morris K. Jesup, to be known as the
 "Eliza De Witt Memorial Room"
 1910 Mrs. John Stewart Kennedy, in memory of her
 husband, to be known as the "J. S. K.
 Memorial Room"
 1912 Peter Cumming, to be known as
 "Peter Cumming Memorial Room"
 1926 Alumnae Association of the School of Nursing of
 The Presbyterian Hospital, to be known as the
 "Amabel G. Roberts Memorial Room"
 1928 Mrs. William Sloane, to be known as "The
 William Sloane Room for Graduate Nurses"
 1930 The Sarah A. Hard Taylor Memorial Fund, to be
 known as "The Sarah A. Hard Taylor Room"
 1935 Mrs. Herbert Neal, in memory of her husband,
 James Norman Hill, deceased
 1937 S. Augusta Mora, in memory of her husband,
 Frank Mora and mother, Sarah Robson
 Van De Water

Babies Hospital

- 1892 The Cribside Committee, known as "Cradyl-Nyst"
 1894 Miss Ellen James Evans
 Mrs. Henry G. Trevor
 1895 Mrs. Evan T. Walker
 Mrs. Richard Arnold, in memory of
 Georgiana Arnold
 1897 Mr. and Mrs. Charles M. Fry, known as the
 "Mr. and Mrs. Charles M. Fry Bed"
 Mrs. George Kemp, "For the use and purposes of
 the Hospital"
 1898 Mrs. Oliver G. Jennings, known as the
 "Brewster Bed"
 1899 Mr. and Mrs. John Sherman Hoyt, in memory of
 John Sherman Hoyt, Jr.
 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory
 of Emily Beaver Chamberlin
 1902 Mr. and Mrs. W. E. Dodge, in memory of
 Grace Osborn
 Henry P. Wertheim, in memory of
 Clara W. Wertheim
 1904 Mr. and Mrs. George Arents, in memory of
 George Arents Brown
 Estate of Mrs. Charles Harvey Hartman
 1905 Mrs. J. Henry Lane
 Mrs. Daniel S. Lamont, known as the
 "Julia Lamont Bed"
 1907 The Cribside Committee
 1908 Arthur W. Butler, in memory of
 Elizabeth Marshall Butler
 1910 Dr. and Mrs. L. Emmett Holt, in memory of
 Kenneth M. Holt
 Edwin Clarence Moller, in memory of
 Peter Moller
 1911 Emily A. Watson, in memory of Wheeler Watson
 Mrs. Bradley Martin, in memory of
 David Bradley Martin
 1912 In loving memory of J. Bradley Cumings,
 endowed by his friends. "Greater love hath no
 man than this, that a man lay down his life
 for his friends." — *St John 15:13*
 1914 Mrs. Andrew Carnegie, in memory of
 Archibald Fraser Barrow
 Mrs. Robert W. Todd, known as the
 "Mabel Todd Bed"
 1916 Mr. and Mrs. John Chandler Moore, in memory of
 Edward de Bébian Moore
 Mrs. John Hubbard, in memory of
 Margaret Fahnestock
 Mrs. Clarence M. Hyde, known as the
 "Clara Mathewson Hyde Bed"
 1917 Harris Brisbane Dick, known as the
 "Harris Brisbane Dick Free Bed"
 Mrs. Edward S. Harkness, known as the
 "Thomas Stillman Taylor Bed"
 Mr. and Mrs. Walter A. Hirsch, in memory of
 John Walter Hirsch
 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of
 their daughter, Anna Kate Bartlett
 Mrs. John Jay Knox, in memory of
 John Jay Knox
 Mrs. John Jay Knox, in memory of
 Dr. Reuel B. Kimball
 1920 Mrs. Andrew Carnegie, "A thanks offering for
 Louise Carnegie Miller"
 1921 The Estate of Jacob H. Schiff
 1922 The Cribside Committee, in memory of
 Sarah Elizabeth Williams
 Mr. and Mrs. Simon Guggenheim, in memory of
 their son, John S. Guggenheim

- 1923 Mr. and Mrs. Herman Armour Nichols, "In loving memory of Marie Louise Nichols"
- 1929 The Estate of Julia M. Stout
- 1930 Edith C. Thompson, in memory of her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 The Estate of Daniel Schnakenberg, in memory of his children, Daniel Schnakenberg, Jr., and Marie Schnakenberg
- 1936 The Estate of Carrie Guggenheim
- 1938 The Estate of Emily S. Hornblower, in memory of her stepdaughter, Susie Sanford Hornblower
- 1949 Dr. Frederic H. Bartlett, "Endowed in loving memory of Frederic H. Bartlett, M.D., 1872-1948, by his patients and other friends to commemorate his many years of faithful service in Babies Hospital"
- 1950 The Estate of Emelyn L. Coolidge, in memory of Marianna Wheeler and Emelyn L. Coolidge, M.D., to be known as "The Wheeler-Coolidge Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her mother, Ernestine Schaffner

Neurological Institute

- 1929 Red Cross Endowed Bed for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband, Allen Starr
- 1959 Mr. Jack J. Dreyfus, Jr., to be known as the "Jack J. Dreyfus, Sr. Bed," in honor of his father

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

- 1952 Estate of John Bahrenburg, in memory of John H. Bahrenburg and Elizabeth Bahrenburg (16 beds)

New York Orthopedic Hospital

- 1883 Miss C. B. Hicks, continued in perpetuity by Buchanan Winthrop
- 1886 Mrs. Elizabeth Milbank Anderson, in memory of J. Milbank Anderson (4 beds)
- 1891 Alfred Corning Clark (3 beds)
Edward Severin Clark, to be known as the "Edward Severin Clark Beds" (2 beds)
Mrs. Henry S. Winthrop
- 1893 Mrs. William D. Sloane, in memory of William Douglas Sloane, Jr.
James K. Gracie, in memory of Anna Bulloch Gracie
Miss Sarah B. Gibbs
- 1894 Mrs. Richard Tylden Auchmuty, in memory of Richard Tylden Auchmuty (2 beds)
James H. Jones
- 1896 Mrs. William Astor, in memory of Helen Roosevelt
Mrs. Evan T. Walker, in memory of John J. Walker
- 1897 Mrs. William D. Sloane, one bed in memory of

- Maria Louise Vanderbilt and one in memory of Emilie Vanderbilt Burden (2 beds)
- 1898 Mrs. Charles B. Alexander, for her daughter, named the "Harriet Alexander Bed"
- 1901 Mrs. N. A. Baldwin, in memory of Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of Benjamin Brewster
Henry T. Sloane, Jessie and Emily Sloane, bed endowed by their father
Mrs. Marion Story, in memory of M. Furman Hunt
- 1902 James Henry Smith, in memory of George Smith (2 beds)
Miss Emily A. Watson, in memory of Mrs. Mary J. Walker
- 1904 Miss Cornelia Prime, in memory of her brother, Temple Prime
Miss Helen Phipps
James K. Gracie, in memory of Esther Gracie Ogden
- 1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of Maurice Dwight Collier
- 1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and Orson D. Munn, in memory of Henry Norcross Munn
- 1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father, Dr. Edward A. Smith, and her mother, Rebecca Miller Smith
- 1913 Estate of Marion de Forest Clark, in memory of Julian Bouton Clark
An anonymous donor, to be known as "Mary Townsend Cuyler Bed"
Carolina F. Butterfield, in memory of Frederick Falconer Butterfield
- 1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as "The Louise Bed"
George Grant Mason, in memory of his uncle, James Henry Smith (2 beds)
- 1916 Henry M. Tilford, in memory of Catharine Hunt Tilford
Estate of Miss Clementine Furniss, to be known as the "Clementine Furniss Bed"
An anonymous donor
- 1917 Mrs. Charles H. Senff, in memory of her little son, Henry Senff
Mrs. A. Murray Young, in memory of her great uncle, Wilson G. Hunt
- 1919 R. Fulton Cutting, to be known as the "Helen Suydam Cutting Bed"
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of Anna Livingston Morton
Miss Georgiana G. R. Wendel, "In Memory of My Sister, Augusta A. S. Wendel" (2 beds)
Various donors, in memory of Theodore Roosevelt
- 1920 Mrs. John Hobart Warren
- 1921 Mrs. Winthrop W. Aldrich, in memory of her little son, Winthrop Williams Aldrich, Jr.

- F. Ambrose Clark, to be known as
"The Florence L. Clark Bed"
- 1922 Mrs. David T. Dana, in memory of her mother,
Mrs. M. Dwight Collier
- 1924 Estate of Charlotte Bruce Bickmore, in memory of
Albert Smith Bickmore, Jr.
Mrs. Louise Ward McAlister Lewis, in memory of
her mother
- 1925 Miss Elizabeth J. Hofer, in memory of
Horatio C. Kretchmar (2 beds)
Percy Chubb, in memory of his wife
Junior Red Cross of the Public Schools
of New York
Mrs. Douglas Robinson, in memory of her friend,
Charles Allen Munn
- 1926 Junior Red Cross of the Public Schools
of New York
- 1927 Darrach Home for Crippled Children, in memory
of Dr. May Darrach
- 1928 Mrs. Mary L. Schoonmaker, in memory of
Sylvanus Lothrop Schoonmaker and
Frank Layng Schoonmaker (10 beds)
Estate of Henry D. Dickinson, in memory of
Hathaway M. Dickinson
- 1930 James T. and Sarah Bancroft Leavitt, to be known
as the "Mrs. James T. Leavitt Bed"
- 1934 Henry C. deRham, Frederic F. deRham and
Clarisse deRham Rutherford, in memory of
their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of
Meredith Howland Pyne
- 1936 Miss Elizabeth Stewart Hamilton, in memory of
Mrs. John Hobart Warren, to be known as the
"Harriette Mott Warren Bed"
Mrs. Edward S. Harkness, to be known as "Dorcas
House Bed" in dear memory of Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the
"Howard and Mary Louisa Potter Bed," in
memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of
Mrs. Maude's father, Robert I. Brewster
Estate of Carrie Rosenshine, to be known as "The
Lillie Rosenshine-Marjorie L. Kaufman Bed"
- 1956 Estate of Adolph Riesenber, to be known as "The
Adolph and Anna R. Riesenber Bed"

ENDOWED ROOMS

- 1922 Glenn Ford McKinney, a ward room in the
country branch, in memory of his wife,
Jean Webster McKinney
- 1929 400 of his friends and associates, a room in the
private pavilion, in memory of H. Le Roy von
Lackum, M.D., surgeon in this hospital,
1916-1928

Institute of Ophthalmology

(Including Herman Knapp Memorial Eye Hospital)

- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer (In memory of her
parents)
- 1923 Miss Mary Wiley (In memory of her brother,
George Wiley)
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Leo Doblin
- 1936 Charles M. Brooks
- 1957 Mortimer and Harriet M. Marcus Foundation,
Inc., to be known as "The Mortimer and
Harriet M. Marcus Endowment Bed"

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Gifts and Bequests

The activities of the Medical Center are supported to a substantial extent by the income from bequests of friends who desire to insure the continuation of their help to the sick.

Depending upon the wishes of the donor or the objects and purposes of the gift, gifts or bequests may be made to any one of the following:

Columbia-Presbyterian Medical Center Fund, Inc.

The Trustees of Columbia University in the City of New York for the use of its College of Physicians and Surgeons.

The Presbyterian Hospital in the City of New York.

Bequests may be made in the following form:

Form of Bequest *I give and bequeath to _____ the sum of _____ dollars (\$ _____) to be applied to the use and benefit of said corporation, under the direction of the Trustees thereof.*

In case it is desired to specify the particular use to which the bequest is to be put, such use may be specified in place of the words "*to be applied to the use and benefit of the said corporation, under the direction of the Trustees thereof.*" in the form of bequest given above.

In case it is desired to make the bequest as a memorial, "*in memory of _____*" may be added to the form of bequest.

The Presbyterian Hospital in the City of New York, by reason of the consolidation of its constituent hospitals at the Medical Center, will receive gifts made to The Presbyterian Hospital in the City of New York, to the Babies Hospital of the City of New York, to Neurological Institute of New York and to New York Orthopedic Dispensary and Hospital. It is, therefore, not necessary to change the provision of any will naming any of the foregoing constituent hospitals as a beneficiary. Of course, a gift or bequest to The Presbyterian Hospital in the City of New York may specify that it is to be used for the benefit of any one of the foregoing constituent hospitals or for any other purpose.

MEDICAL CENTER



The Presbyterian Hospital in the City of New York

622 WEST 168TH STREET, NEW YORK 32, N. Y.



College of Physicians and Surgeons • Columbia University
in the City of New York

630 WEST 168TH STREET, NEW YORK 32, N. Y.

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SECOND COMBINED ANNUAL REPORT
of the
COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York 32, N. Y.



College of Physicians and Surgeons • Columbia University
in the City of New York

and

The Presbyterian Hospital in the City of New York

December 31, 1960

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who prepare to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

COVER: Artist's rendering of the 168th Street view of the Medical Center showing proposed plans for new main entrances to Presbyterian Hospital and the College of Physicians and Surgeons, a new auditorium and, at right, the William Black Medical Research Building. Proposed development program construction is depicted in a sepia tone.

PHOTOGRAPHY: All photography by Werner Wolff of Black Star except the photograph on page 116 by Dr. Vladimir N. Epanchin.

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Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institu-

tions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the President of the College of Physicians and Surgeons. The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928 the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for all the voluntary hospitals and clinics at The Columbia-Presbyterian Medical Center. Some 138,000 patients a year are cared for in the hospitals, clinics, and doctors' offices of the Medical Center. The group consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison and Park Avenues between 70th and 71st Streets. On April 25, 1911, Presbyterian Hospital made its original arrangement with Columbia Univer-

sity's College of Physicians and Surgeons for coordinating the care of the sick with the educational and research program of the University. Now Presbyterian Hospital is the largest single unit of the Medical Center. The Hospital occupies a 22-story building in which are the wards of the Medical and Surgical Services, Obstetrical and Gynecological Service, Urological Service, Ear, Nose and Throat Service, Dermatological Service and the Orthopedic Surgery Service.

Babies Hospital

Babies Hospital, 167th Street and Broadway, founded in 1887, provides for general medical and surgical care of infants and children up to their thirteenth birthday, and care for premature babies. The total capacity of the Hospital is 196. One floor is devoted to the care of private and semi-private patients. Both outdoor and indoor playrooms are provided for convalescent children. Laboratories are operated for the diagnostic and research work of the Hospital in pathology, microbiology and chemistry. An X-ray and fluoroscopic department is operated under the direction of the Hospital radiologist. An outpatient department is maintained in Vanderbilt Clinic by the attending and house staff of the Hospital. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

Harkness Pavilion

Harkness Pavilion, 180 Fort Washington Avenue, erected when the Medical Center was established in 1928, is available for the accommodation of 300 adult private patients of the attending staff.

The Mary Harkness Convalescent Home

Mary Harkness Convalescent Home, King Street, Port Chester, N. Y., opened in 1937 to provide convalescent care for adults. In a beautiful country setting, facilities are available for the convalescent care of 33 adults.

The Institute of Ophthalmology

Institute of Ophthalmology, 635 West 165th Street, opened in 1933, has complete facilities for the medical and surgical treatment of adult and child patients with diseases of the eye. There are

private, semi-private and ward beds, with a total capacity of 92. On January 1, 1940, the work of the Herman Knapp Memorial Eye Hospital was taken over by the Institute.

The Neurological Institute

Neurological Institute, 168th Street and Fort Washington Avenue, one of the first nongovernmental hospitals in this country for the treatment of nervous diseases, was founded in 1909. It moved from East 67th Street to the Medical Center in 1929. Its affiliation with The Presbyterian Hospital has made possible a broad basic program of teaching and research in neurology and in the treatment of diseases of the nervous system and surgical conditions of the brain and nervous system. The Institute has a capacity of 216 beds, including 15 added in 1960 for psychiatric patients.

New York Orthopaedic Dispensary and Hospital

The New York Orthopaedic Dispensary and Hospital opened as a dispensary in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President of the same name. In succeeding years, the dispensary grew into a hospital with beds for ward and private patients. In 1911, the first spinal fusion operation for Potts Disease (tuberculosis of the spine) was performed by Dr. Russell A. Hibbs. This successful operation opened an entirely new era in the treatment of this disease. The Orthopaedic Dispensary and Hospital was located in its own buildings at 420 East 59th Street until December, 1950, when it moved to the Medical Center. On the 5th floor of the main building, 622 West 168th Street, facilities are available for the care and treatment of orthopedic conditions and fractures in children and adults.

The School of Nursing

The School of Nursing was founded in 1892 for the training of nurses. Since 1935, its educational program has been under the supervision of the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University. A thirty-two-month course in nursing is conducted, and graduates receive the degree of Bachelor of Science from Columbia University.

The Sloane Hospital for Women

Sloane Hospital for Women was built at West 59th Street and Amsterdam Avenue and presented to Columbia University by Mr. and Mrs. William D. Sloane in 1886. It now occupies three floors of the Presbyterian Hospital building for ward and semi-private patients and one floor in Harkness Pavilion for private patients. There are 181 beds, of which 116 are ward beds.

The J. Bentley Squier Urological Clinic

The J. Bentley Squier Urological Clinic occupies the 10th floor of the Presbyterian Hospital building and the 10th floor of Babies Hospital. There are 67 beds for the care of adults and 19 beds for children. There are laboratories fully equipped to do diagnostic, X-ray, bacteriological, pathological, fluoroscopic, and research work. This unit has two large, especially equipped, operating rooms. The urological outpatient department is in Vanderbilt Clinic.

Vanderbilt Clinic

Vanderbilt Clinic, Broadway and 167th Street, presented to Columbia University by the Vander-

bilt family in 1888, is the common outpatient department and admitting service for all the wards of all the units of The Presbyterian Hospital. It is a fully equipped dispensary offering complete medical, surgical and specialty services. Eligibility to the Clinic is determined by the admitting physician and the clinic interviewer and is limited to those unable to afford a private physician. The Group Practice Clinic, organized in 1946, has proved a forward step in the diagnosis and treatment of patients.

Other Patient Care Institutions Located at the Medical Center

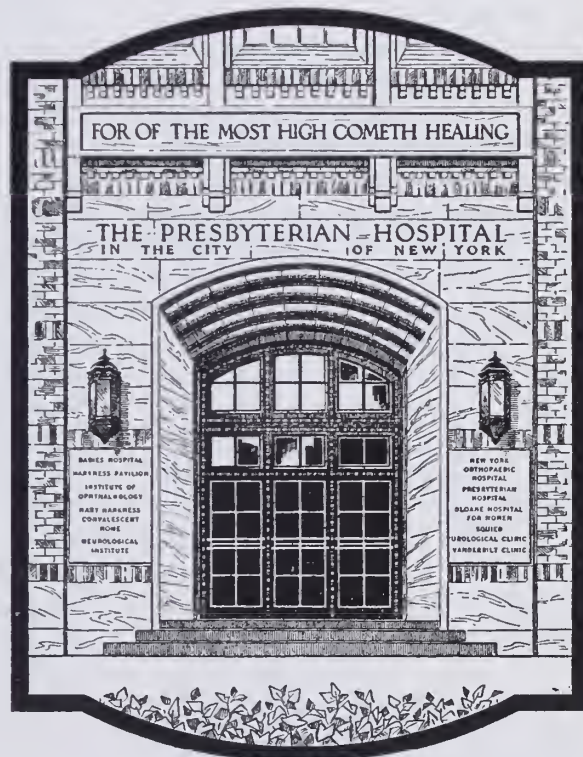
The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Francis Delafield Hospital, built and maintained by the City of New York, is a 295 bed hospital for the treatment and study of cancer.

The Washington Heights Health and Teaching Center was built and is maintained by the City of New York.

Report of the President

The Presbyterian Hospital in the City of New York





Report of the President of Presbyterian Hospital for 1960

1960 was a year of much progress well balanced among new tasks and basic services, each in harmony with the high purposes which unite the Presbyterian Hospital and the College of Physicians and Surgeons of Columbia University as the Columbia-Presbyterian Medical Center.

Our joint \$50,000,000 development program, the result of cooperative planning, was announced formally on January 24, 1960. Already more than a third of the money has been subscribed in the campaign so ably led by General Lucius D. Clay. Last November ground was broken for the first unit of construction — the central service building. We have made a good beginning but it merely points up the tremendous undertaking which lies ahead.

The development program meets a specific need for working space and equipment to carry forward important research, all directed toward saving lives and restoring health. The direct cause and effect relationship of research and therapy has been aptly set forth by a compilation of major “break-throughs” in medical knowledge achieved at the Medical Center. Nevertheless, much confusion persists in the mind of the lay person about scientific methods and concepts. To millions science is identified with magic. To other millions the scientist is a super-being whose mind operates with unswerving precision, producing inevitable conclusions from unambiguous facts, preferably working, as the Curies did in an unheated shed. Those are unwarranted impressions but, I think, prevalent enough to demand attention.

Ideas come to medical scientists just as they come to anyone else but these ideas usually are of very little use until checked and verified through observation and experiment. The great discoveries in the medical field most frequently come from accumulated knowledge, which has been gathered bit by bit by many workers over long years of study. One man or perhaps a team may

uncover the last finding which, when added to previously accumulated knowledge, provides the final element needed for a dramatic new cure. Yet the last discovery cannot be effective unless the earlier ones have prepared a foundation for it.

Many advances are due not directly to new ideas but to improved techniques and craftsmanship. Almost every advance in our understanding of the living cell has had behind it some advance in technical skill. As an example, the techniques of microscopy improved progressively until new scientific ideas gave us the present uses of ultra-violet light and the electron microscope. Without those instruments, many of the facts of human heredity now available would still be unknown.

The most effective medical research is that conducted with the advantages of adequate working space and fully equipped laboratories used by senior scholars and competent scientists, each understanding, as Pasteur remarked, that “chance favors the prepared mind.” It is exactly such scientific inquiry and teamwork, so greatly enhanced by access to clinic and hospital, which our development program is designed to serve.

The important and productive research now being pursued at the Medical Center, is one of the subjects described within this combined report. This phase of our activity shares the same ultimate objective of all our hospital activities reported in this record of 1960 — that objective being to provide the best possible treatment and care for every patient.

The significance of the record for 1960 is sharply defined when studied against the background of changes during the last ten years which have affected hospital care.

During the last decade the average patient stay in the Presbyterian Hospital was reduced by one and a half days. In 1960 the average stay was fractionally under twelve days. Yet, in the same period, while the average stay was reduced notably, there was, for instance, a doubling of the

number of "complex" surgical operations. Probably the most dramatic of these is the "open heart" program, begun clinically in 1955, the evolution of a pioneering experience in surgery for repair of the heart going back in our history to 1940. From whatever viewpoint, the progress of medical knowledge is evident, both in an increased ability to deal with the common problems and a greater capacity to attack the more difficult ones.

The public, during the same time, has made known emphatically that it desires — and expects — more medical attention. In 1950 the users of the Blue Cross type of insurance represented 32 per cent of our total patient days. In 1960 they exceeded 50 per cent. When those using all types of insurance and assistance — municipal, state and veterans benefits — are considered together, the proportion approaches 85 per cent. In 1960 the scope of Blue Cross insurance was broadened, premiums were raised and steps were taken toward the reimbursement of hospitals on a basis more nearly reflecting the costs of services rendered. In 1960, too, the New York City government increased somewhat the rate of payments for the care of indigent patients although the rate remains far below actual costs.

Two statistics show the vital problem of ever rising costs. For an average patient stay in 1950 of thirteen and a half days the cost was \$285. For the shorter average stay in 1960 the cost was \$470. In each case wages and personnel benefits were the predominant element.

Substantial improvements were made in 1960 to our physical plant, contributing markedly to efficiency. Centralized food tray service for patients was initiated providing better service to our patients. Improved cafeteria facilities were provided by the enlargement of the first floor cafeteria. These two projects have enhanced the efficient serving of a daily total of almost 10,000 meals to patients, personnel and visitors.

Remodeling of the Neurological Institute progressed in 1960 in the award of contracts as well as in the work initiated for renovation of the eighth and ninth floor patient areas for rehabilitation facilities and centralization of the X-ray equipment in the basement.

Two service elevators were replaced in the Hospital during the 1960 phase of our moderni-

zation program which, by continuing installments, will improve passenger and service traffic in Presbyterian Hospital, Harkness Pavilion, Babies Hospital, the Institute of Ophthalmology and Maxwell Hall. Other projects completed included a major improvement in the basic electrical system and the installation of two oil-fired heating boilers.

The summary below for the last calendar year tells a story of achievement. Our generous friends, new and old, will, I believe, find it deserving of their steadfast support.

In 1960, the Presbyterian Hospital provided 468,000 days of hospital care for 39,300 inpatients and accommodated 401,900 clinic visits of which 106,400 clinic visits were free of charge.

Our total operating expenses were \$25,148,000 of which \$14,794,000 was paid out in wages.

After receiving \$21,835,000 from patients and others, the large operating loss of \$3,313,000 was reduced by the income from endowment and by contributions to a net loss of \$63,402.

In the hospital what each person does is indispensable to the successful accomplishments of so many other persons. I have particularly in mind the employees of the Presbyterian Hospital who help the professional staff in the care of the patient. Their responsibilities are continual; their standards are exacting. In turn their compensation must be adequate. During 1960, a broad rise in wages was announced for the entire payroll. During the years between 1950 and 1960, in successive steps, our life insurance program has been improved and benefits broadened under our retirement plan. Each is a non-contributory program; each is a benefit above and beyond the medical care provided for employees and the established disability benefits.

The effectiveness of our constant program to provide agreeable and favorable conditions of work for employees is reflected in their sincere loyalty. One of the most significant statistics of hospital employment is the turnover rate. This rate at Presbyterian has been reduced by one-third over the past decade. We have, I feel, good grounds for expecting greater stability.

I am particularly gratified to report the con-

tinued service of three devoted trustees who, during 1960, became honorary trustees. These are Charles P. Cooper, President Emeritus of Presbyterian Hospital since 1957, a trustee for twenty-three years and, from 1943 to 1957, President of the Hospital; Pierpont V. Davis, a trustee since 1943, and William J. Wardall, a trustee since 1944. All of these men continue to manifest a great interest in Presbyterian Hospital.

It is with equal pleasure that I report the election of August Belmont, Howard L. Clark and W. E. S. Griswold, Jr. to the Board of Trustees. Mr. Griswold has been a trustee for eighteen years, serving in an honorary capacity from 1957 until last year.

My deep thanks go to our excellent profes-

sional staff and all our personnel for their dedicated services. A special word of appreciation is due the many volunteers who gave 117,946 hours of faithful service. Particular thanks are also due the members of the Auxiliaries. Our profound thanks are extended to the Trustees for their wise guidance and, indeed, too, for their fruitful work in behalf of the development program. The results of the year past represent, I believe, the warm wholehearted response of everyone at the hospital to the call of mankind.

CLEO F. CRAIG
President

February 20, 1961

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

A sense of quickening change, foreseen in the new plans and new appointments of the years immediately preceding, was felt throughout the Medical Center during the past year. In January the campaign to raise funds for expansion of facilities and increased endowment began auspiciously with the announcement of substantial contributions. These have been followed by a continuing succession of generous gifts. Ground has been broken for the service building. Completion of this building, by permitting relocation of the laundry from the college building and other services from the hospital, is the first necessary step. At the same time the faculty has begun the difficult but stimulating task of discussing with the architects plans for laboratories to be built in the research building.

Staff Changes

During the year four members of the Medical Board were made honorary members on retirement. Two, Professor Rustin McIntosh and Professor Franklin M. Hanger, had served as President of the Medical Board and all had worked long and effectively on key committees of the Board over the many years of their membership. Fuller recognition of the achievements of Professor McIntosh, Professor Harry P. Smith, Professor Hanger and Professor George W. Fish is given in the Dean's report and in the departmental reports.

In January, Dr. Gilbert P. Smith, Dean of the Columbia University Dental School at the Medical Center joined the Medical Board as Director of the Service of Dental and Oral Surgery. This service, intimately linked with patient care in the hospital, has been throughout the year beset with many problems which urgently need solution. While the relationship of the Dental School to the Medical Center as a whole is a policy matter which falls beyond the jurisdiction of the Medical Board, the latter recognizes the difficulties in pro-

viding the ideal patient care in this area which is its proper concern, that are inherent in the present situation.

The Medical Board welcomed the addition of two new Directors of Services on July 1st. On that date Dr. Edward C. Curnen, Jr., was appointed to succeed Dr. McIntosh and Dr. Donald G. McKay was appointed to succeed Dr. Smith. The accomplishments of these new departmental chairmen is described in the Dean's report.

Structural Changes

With the excavation for the new service building already started and the plans for the research building under active discussion, the development program is now under way. At the same time the Joint Committee on Facilities continues active in formulating plans and priorities for the remainder of the program. In the meanwhile steady progress has been made in the many alterations previously undertaken.

The third floor operating suite in the Presbyterian Hospital stem was further improved and has served admirably for both out-patient operations and major surgery in urology and plastic surgery. The cardiac surgery recovery room is serving well in the care of increasing numbers of patients under the guidance of Dr. A. Gregory Jameson, and has already come into such demand that a further expansion of facilities is desirable.

In the Neurological Institute reconstruction is nearing completion. Renovation of the elevators, though seriously delayed by a prolonged strike, is again making progress. Reconstruction of kitchen facilities to provide tray service for all patients has been accomplished, and many other less obvious but no less important renovations such as those in the boiler room and electrical supply have been noted with satisfaction by the Planning Committee of the Medical Board.

Committee Activities

With the retirement of Dr. Hanger, the chairmanship of the Committee on Residency Program was transferred to Dr. Robert H. E. Elliott, Jr. This committee is responsible to the Board for the often difficult problem of maintaining the balance in house staff members between the minimum required for adequate service, and the maximum that can be trained within the limits of facilities and patient material. This year increasing availability of outside sources of support, in many ways a desirable development, has posed a number of special problems. Expanded and improved training programs in pathology and ophthalmology and increasing service load in anesthesiology have resulted in the recommendation of additional staff in these residences. Scattered increases in other departments have also been approved.

The closely related Committees on Hospitalization and Home Care, and that on Private Patient Care have been changed from ad hoc to standing committees, and have been considering means to improve the effective use of beds and availability of services. Subcommittees of each are currently studying various suggestions made by these committees. A score of other committees have continued to render valuable service in bringing to

the Medical Board the many suggestions and recommendations which provide the basis for its actions.

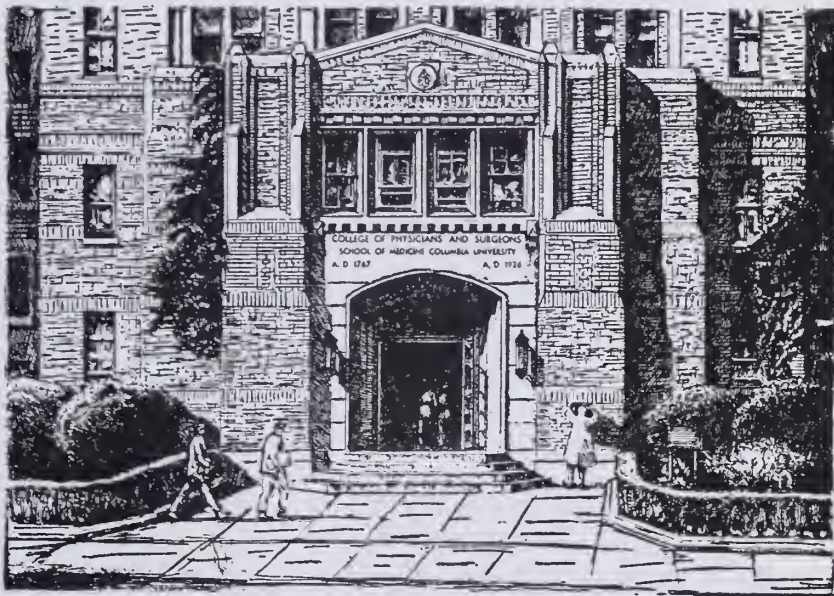
Dr. Frank E. Stinchfield and the members of the Doctors' Committee for the Development Program have worked vigorously throughout the year. The professional staff has been most grateful for this committee's guidance in how best they may show their appreciation for the opportunities afforded them at the Medical Center in the formidable task of fund-raising which is recognized to be essential if we are to continue properly to fulfill our mission.

The three-year term of the present President will terminate in June of 1961. It has been a privilege to represent and work together with so fine a group toward a common goal. He has been grateful for the invitation by the President and Trustees of the hospital to attend their monthly meetings and there present the actions and opinions of the Medical Board. The interest, sympathy and understanding of the Trustees in the activities and aspirations of its professional staff has been gratifying. With such continuing support, the staff can feel the greatest confidence in the future of the Medical Center.

GEORGE H. HUMPHREYS, II, M.D.
President of the Medical Board

Report of the Dean of the Faculty of Medicine

College of Physicians and Surgeons
Columbia University in the City of New York



... ..

... ..



Report of the Dean of the Faculty of Medicine

The medical schools of this country are passing through a critical stage in their development. Their obligations are increasing at a rate which is so fast that it is difficult for them to keep pace. In recent years as a result of availability of funds for research, most of our schools have changed from schools of medicine to research institutes and university centers for the education of medical students. This change has been difficult because of the inadequacy of space and scarcity of well-trained teachers and investigators. Other problems that face us include a pressure for the expansion of our classes at a time when the number of students available for admission to our schools is at a low level and the annual cost of their education is steadily increasing; the demand of voluntary and government-supported hospitals for assistance in the training of their intern and resident staff in order to elevate the calibre of care of the patients in their hospitals; and a progressive increase in the number of patients with insurance covering the cost of hospital care and physician's fees, leading to a decrease in the number of patients in so-called "ward beds" which have been the traditional point of contact between the student and teacher.

Fortunately there has been no decrease in the number of patients admitted to the wards and clinics of the Medical Center. In fact, our great difficulty lies in the fact that we are not able to send undergraduate medical students to our affiliated hospitals in sufficient numbers to satisfy the wishes of these hospitals. At long last, the Board of Directors and the clinical staffs of the voluntary and municipal hospitals have come to realize that the presence of medical students on the wards of their hospitals elevates the level of the care of their patients and raises the morale of the whole institution.

There has been a great deal of debate in recent months with regard to the need of expansion of our medical schools to meet the projected increase in our population. Arguments to attest to the reality of this need include the great shortage of interns and residents in many voluntary and

municipal hospitals, the demand of our citizens for extension of medical services and the desire of more hospitals to participate in the teaching of medical students. There is concern about the validity of these arguments. Some observers claim that the number of physicians trained by our medical schools is sufficient for the care of the health of our citizens, although they agree that there is an inequity in their distribution between urban and rural communities. With regard to the ability of medical schools to graduate a sufficient number of students to fill all of the approved internships, it is agreed that this is not possible and is undesirable. The internship is an essential extension of the period of medical education. Improvement of the educational opportunities may attract interns to some of the hospitals which are inadequately staffed but it is unlikely that the practices of medicine could absorb this large number of physicians. Another solution to the problem of the care of the patients in these hospitals must be found. Regardless of the validity of the arguments for and against the need for more physicians, there is a strong sentiment, especially in governmental circles, for the development of new medical schools.

Some of the problems that must be solved, particularly if the quality of the educational program is not sacrificed, include the training of additional teachers and a reduction in the cost of medical education in order to attract students of high calibre.

The School in the past year suffered great losses in the retirements of Drs. Robert F. Loeb, Rustin McIntosh and Harry P. Smith.

Dr. Loeb came to the Medical School in 1921 as Assistant in Medicine. He became Bard Professor of Medicine in 1947 upon the retirement of Dr. Walter W. Palmer. Under his guidance the department advanced to eminence unequalled in this country. He will be greatly missed not only because of his ability as a teacher, clinician and investigator but also because of his leadership in the School.

Dr. McIntosh came to the School in 1924 as

Assistant in Pediatrics and became Carpentier Professor of Pediatrics in 1930. His influence on the Babies Hospital and the Columbia-Presbyterian Medical Center is emphasized in the report of his successor, Dr. Edward C. Curnen, Jr.

Dr. Smith came to the School in 1945 as Delafield Professor of Pathology. He put his heart into the teaching of medical students and developed a program that was a model for the country. We are fortunate to have as his successor, Dr. Donald G. McKay, who came to us from the Department of Pathology at Harvard Medical School.

Dr. Wilfred M. Copenhaver was promoted to Chairman of the Department of Anatomy to assume the position previously occupied by the late Dr. Samuel R. Detwiler. During his term as Acting Chairman of the department, Dr. Copenhaver advanced greatly the teaching and research activities of the department.

The registration of the School of Medicine in September, 1960 was as follows:

First Year	120
Second Year	119
Third Year	120
Fourth Year	<u>119</u>
	478

The Committee on Admissions screened 1,214 qualified applicants for the study of medicine and admitted the usual class of 120. There were 108 men and twelve women in the entering class. They came from fifty different liberal arts colleges, bringing a wide variety of liberal arts education to the class.

The class is widely distributed by home residence, twenty-nine states being represented. Six veterans and twenty-two sons and two daughters of physicians are among the members of the class. Midyear faculty reports indicate that the class measures up to the high standards for scholarship, motivation and character set by previous classes.

Dean Severinghaus has had a busy schedule of outside responsibilities. He gave the Lyman Duff Memorial Lecture at McGill University in Montreal; addressed the General Assembly of Wilkes College; was the keynote speaker at the Conference of Southern Negro Colleges at Dillard University, New Orleans; and at the week-long Conference on Medical Education for Foreign

Scholars in the Medical Sciences held at Boulder, Colorado. He was also the guest lecturer at the Regional Conference on Premedical and Medical Education held at the University of Illinois.

After serving for four years on the Neurological Science Research Training Committee of the National Institutes of Health, Dr. Severinghaus has accepted the Chairmanship of the Committee for the next two years.

The volume, "Preparation for Medical Education in the Liberal Arts College — A Restudy," has gone to press and publication is expected early in 1961. This book, of which Harry J. Carman and William Cadbury are joint authors (along with Dean Severinghaus), covers a two year resurvey of liberal arts education and supplements an earlier study published in 1953.

The registration of the School of Dental and Oral Surgery in September, 1960 was as follows:

First Year	40
Second Year	35
Third Year	39
Fourth Year	<u>38</u>
	152

There were twenty-four students registered for non-credit postgraduate courses in the Dental School and sixty-two students registered for postgraduate credit courses. A class of twenty-nine students was enrolled in September, 1960 for the Courses for Dental Hygienists. Fifteen received the Bachelor of Science degree in 1960.

In the School of Public Health and Administrative Medicine the registration in September, 1960 was as follows:

D.P.H. candidates	3
M.P.H. candidates	25
M.S. candidates	45
Special students	<u>37</u>

In September, 1960 the registration in the Department of Nursing was as follows:

First Year	148
Second Year	111
Third Year	<u>114</u>
	373

In the Course for Occupational Therapists thirty-six students were registered in September 1960. In the Course for Physical Therapists thirty-seven students were registered.

The following degrees were awarded:

M.D.	116
Med.Sc.D.	1
D.D.S.	38
D.P.H.	1
M.P.H.	38
M.S. (Nursing and Public Health fields).....	44
B.S. (Nursing, Occupational Therapy, Physical Therapy, Dental Hygiene).....	165

In addition to the students enrolled under the Faculty of Medicine, there were approximately fifty students registered under the Graduate Faculties of the University who took courses and advanced research work in the departments of the Medical School.

The preceding figures indicate that the Faculty of Medicine is responsible for the instruction of many more students, graduate and undergraduate, than is commonly known. The total of medical, graduate, postgraduate, nursing, occupational therapy, physical therapy, dental, dental hygiene, and public health students, visiting scholars, fellows, hospital residents and younger staff members runs to over three thousand full-time and part-time students.

It is gratifying to report that during the academic year 1959-60, 197 medical students received scholarships averaging \$600. Of these, 63 were summer research scholarships.

It is with the greatest sorrow that we report the following deaths:

- David Adlersberg, Assistant Clinical Professor of Medicine (Mt. Sinai), on January 10, 1960
- Morris Greenberg, Lecturer in Public Health and Administrative Medicine, on May 25, 1960
- Joseph W. Jailer, Associate Professor of Clinical Medicine, and Associate Attending Physician, Presbyterian Hospital, on August 23, 1960
- Howard H. Mason, Consultant, Presbyterian Hospital (former Clinical Professor of Pediatrics), on May 8, 1960
- Robert B. McGraw, Clinical Professor of Psychiatry and Attending Psychiatrist, Presbyterian Hospital, on October 23, 1960
- Robert S. McGraw, Instructor in Psychiatry and Assistant Attending Psychiatrist, Vanderbilt Clinic, on October 24, 1960
- Philip C. Potter, Consultant, First Surgical Division, Bellevue Hospital, on November 7, 1960
- Lewis B. Robinson, Consultant, Presbyterian Hospital, on April 24, 1960
- Frederic D. Stern, Assistant Clinical Professor of Neurology (Montefiore), on April 3, 1960

The following retirements, effective June 30, 1960, are reported:

- Alvan L. Barach, Clinical Professor of Medicine and Attending Physician, Presbyterian Hospital
- John Caffey, Professor of Radiology and Attending Radiologist, Presbyterian Hospital
- C. Jarvis Coffin, Associate Clinical Professor of Medicine (St. Luke's)
- Henry S. F. Cooper, Associate Clinical Professor of Surgery and Associate Attending Surgeon, Presbyterian Hospital
- Virgil G. Damon, Clinical Professor of Obstetrics and Gynecology and Attending Obstetrician and Gynecologist, Presbyterian Hospital
- Giocchino Failla, Professor of Radiology (Physics)
- Sol Fineman, Associate Clinical Professor of Radiology (Montefiore)
- George W. Fish, Professor of Clinical Urology and Attending Urologist, Presbyterian Hospital
- Franklin M. Hanger, Jr., Professor of Medicine and Attending Physician, Presbyterian Hospital
- Robert F. Loeb, Bard Professor of Medicine, Chairman of the Department of Medicine, Attending Physician and Director of the Medical Service, Presbyterian Hospital
- Rustin McIntosh, Carpentier Professor of Pediatrics, Chairman of the Department of Pediatrics, Attending Pediatrician and Director of the Pediatric Service, Presbyterian Hospital
- Edith H. Quimby, Professor of Radiology (Physics)
- Harry P. Smith, Delafield Professor of Pathology, Chairman of the Department of Pathology, Attending Pathologist and Director of the Pathology Service, Presbyterian Hospital
- William B. Snow, Professor of Physical Medicine and Attending Physician, Physical Medicine, Presbyterian Hospital

The following emeritus designations were made by the Trustees, effective July 1, 1960:

- John Caffey, Professor Emeritus of Radiology
- Giocchino Failla, Professor Emeritus of Radiology (Physics)
- George W. Fish, Professor Emeritus of Clinical Urology
- Franklin M. Hanger, Jr., Professor Emeritus of Medicine
- Robert F. Loeb, Bard Professor Emeritus of Medicine
- Rustin McIntosh, Carpentier Professor Emeritus of Pediatrics
- Edith H. Quimby, Professor Emeritus of Radiology (Physics)
- Harry P. Smith, Delafield Professor Emeritus of Pathology
- William B. Snow, Professor Emeritus of Physical Medicine

Effective July 1, 1960, the following designations were made:

- Stanley E. Bradley, Bard Professor of Medicine
- Wilfred M. Copenhaver, Chairman of the Department of Anatomy

The following promotions were made, effective July 1, 1960, unless otherwise indicated:

Henry Aranow, Associate Professor of Clinical Medicine
 Sidney Blumenthal, Professor of Clinical Pediatrics
 James B. Campbell, Associate Professor of Neurological Surgery
 Sidney Carter, Professor of Clinical Neurology
 Irwin Clark, Associate Professor of Biochemistry (Orthopedic Surgery)
 George F. Crikelair, Professor of Clinical Surgery
 Harry W. Fritts, Jr., Associate Professor of Medicine
 Harry Grundfest, Professor of Neurology
 Rejane M. Harvey, Associate Professor of Clinical Medicine
 Morris B. Jacobs, Associate Professor of Occupational Medicine
 Richmond L. Moore, Associate Professor of Clinical Surgery
 Melvin L. Moss, Associate Professor of Anatomy
 Erwin H. Mosbach, Associate Professor of Biochemistry
 William L. Nastuk, Professor of Physiology
 Philip Polatin, Professor of Clinical Psychiatry
 Oswald A. Roels, Associate Professor of Nutrition, from September 1, 1960
 Harald H. Rossi, Professor of Radiology (Physics)
 Joseph C. Turner, Professor of Medicine
 Carmine T. Vicale, Professor of Clinical Neurology
 James W. Wolff, Associate Professor of Clinical Pediatrics
 Hans H. Zinsser, Associate Professor of Clinical Urology

The following new appointments were made, effective July 1, 1960:

Edward C. Curnen, Carpentier Professor of Pediatrics, Chairman of the Department of Pediatrics, Attending Pediatrician and Director of the Pediatric Service, Presbyterian Hospital
 Donald G. McKay, Delafield Professor of Pathology, Chairman of the Department of Pediatrics, Attending Pathologist and Director of Pathology Service, Presbyterian Hospital
 George A. Perera, Assistant Dean
 Paul S. Russell, Associate Professor of Surgery (Microbiology), and Associate Attending Surgeon, Presbyterian Hospital

The following changes in titles, effective July 1, 1960, are reported:

Nathan Lane, Associate Professor of Surgical Pathology
 Raffaele Lattes, Professor of Surgical Pathology

The Graduate and Postgraduate Program

During the past year the graduate and postgraduate programs have continued to attract a large number of students. At present some 251 Interns and Residents, 247 Trainees and Fellows, including some fifty-five Visiting Fellows, are undergoing training at the Medical Center. In addition, the staff is responsible for all or part of the training of physicians in hospitals affiliated with the Medical School.

The postgraduate program offered sixty courses during the past academic year. Eight hundred and fifty-eight physicians registered for these courses as follows:

	<i>Number of Courses</i>	<i>Number of Students</i>
Columbia-Presbyterian Medical Center	23	569
Hospital for Joint Diseases.....	2	14
Montefiore Hospital	14	75
Mount Sinai Hospital.....	21	200
Total	60	858

There has been continued interest in the degree of Doctor of Medical Science. The degree was awarded to Dr. Hubert Rosomoff at the commencement exercises held in June. Dr. Yousif Al-Naaman completed all the requirements for the degree which will be awarded at the mid-year commencement. There are at present six candidates from various departments working toward the degree. This increased registration is due to the fact that some departments have added an additional year of research activity to their residency training programs.

Student Health Service

The Student Health Service, under the faithful direction of Dr. Albert R. Lamb, Jr., continues to meet the health needs of the students and employees of the Faculty of Medicine.

During the past academic year 1959-60 there were 374 routine physical examinations on students. Routine chest X-rays and routine dental examinations, including X-rays, are available to the student body. Besides providing routine health services, the Student Health Service continues to help students in other ways, such as rendering premarital examinations, completing insurance forms and offering other similar services.

The Personnel Health Service, with Dr. Joseph J. Barlow, Physician-in-Charge, has performed 229 pre-employment physical examinations. In addition, there have been 708 routine physical examinations, office visits and the like.

H. HOUSTON MERRITT, M.D.
Dean of the Faculty of Medicine

December 30, 1960

Reports of Departments
and Services



Anatomy

WILFRED M. COPENHAVER, *Professor and Chairman of the Department*

The Department of Anatomy has attempted to maintain a proper balance between its teaching and research activities while emphasizing both fields of endeavor, and holding to the view that good teaching and good research are mutually beneficial rather than antagonistic.

The department has been strengthened by new appointments as follows: Dr. I. Lester Firschein, as a full-time Instructor; and, Dr. Philip W. Brandt and Dr. Virginia M. Tennyson as part-time Instructors. Dr. Firschein is engaged in research in genetics and is participating in instruction in genetics and in gross anatomy. Dr. Brandt and Dr. Tennyson received their Ph.D. degrees in anatomy during the current year under the sponsorship of Professor George D. Pappas. They are continuing their research in the field of electron microscopy, with the support of research grants, and they are also participating in teaching.

The teaching program for first year medical students has not been altered markedly since the over-all curricular changes made by the Medical School in 1958. The department teaches histology concurrently with biochemistry during the first trimester, and gross anatomy concurrently with physiology during the second and third trimesters. Neuroanatomy is correlated with neurophysiology, neurochemistry, neurology and psychiatry in an interdepartmental course on the nervous system. The Anatomy Department also collaborates in an interdisciplinary course in statistics-genetics-embryology, working with the Departments of Biochemistry, Medicine, Microbiology, Obstetrics and Gynecology, Pediatrics, and Public Health and Preventive Medicine.

The course in histology includes more electron microscopy and more histochemistry than formerly. It is hoped that modernization and expansion of the teaching laboratories can be achieved concurrently with the erection of the new research building.

The department continues to give five courses to first year dental students and has devoted considerable time to reorganization of gross anatomy

and embryology. Members of the department also give courses in the School of General Studies and in the Summer Session, and they participate in resident training in orthopedic surgery, ophthalmology, otolaryngology, and neurology.

Nine graduate students are working for the Ph.D. degree. Five postdoctorals are in residence, working on research projects in the neuroanatomical sciences, supported by a postdoctoral training program in neuroanatomy, under the direction of Professor Malcolm B. Carpenter. Additional postdoctorals and visiting scholars are in residence under other fellowship programs.

The department had an active role in the Seventh International Congress of Anatomists held in New York City in April, 1960. The majority of the staff members presented papers at the scientific sessions. In addition, Professor Wilfred M. Copenhaver served as Treasurer for the Congress and as the departmental representative on the Local Committee; Professor Herbert O. Elftman was a member of the Program Committee; and Professor George K. Smelser organized a Symposium on the Eye.

Research Activities

An expansion in research has been facilitated by increased grants and by continued collaboration with other departments. The chief research activities are as follows.

Professor Frederic J. Agate Jr. is studying the effects of induced hypothermia in rats. A part of the work is in collaboration with Dr. Mieczyslaw Finster, Visiting Fellow in the Department of Anesthesiology. Professor Agate is continuing to collaborate with Dr. Sam M. Beiser, Associate Professor of Microbiology, Dr. Bernard Erlanger, Associate Professor of Microbiology, and Dr. Seymour Lieberman, Associate Professor of Biochemistry, on studies on the endocrine and anti-hormonal properties of steroid-protein conjugates. Professor Agate is also collaborating with Dr. William A. Silverman, Associate Professor of Clinical Pediatrics, and Associate Attending

Pediatrician, on studies of temperature control in premature infants.

Professor Edmund Applebaum is collaborating with Dr. Edward V. Zegarelli, Professor of Dentistry and Attending Dental Surgeon, and Dr. Austin H. Kutscher, Assistant Professor of Dentistry, in studying the effects of tetracycline on oral tissues of the rat.

Professor Carpenter is continuing studies on the neural basis of cerebellar deficits in the rhesus monkey. He is also engaged in a series of studies on the anatomical organization of the vestibular system.

Professor Elftman has continued his studies of the histochemical responses of the female organs to endocrine stimuli in the rat and the mouse. The exceptionally sensitive method of estrogen assay which he developed last year has been applied to the determination of the fluctuations in estrogen level which are characteristic of the normal cycle and pregnancy with concomitant estimation of progesterone level and of pituitary participation. Professor Elftman has continued to serve as a member of the Committee on Prosthetics Research and Development of the National Research Council.

Professor Charles A. Ely is studying the function of the irradiated and non-irradiated ovary of the mouse by observing changes in the vaginal smear after treatment with antigonadotropic sera. Similar antisera are being used in an attempt to regulate ovulation. Professor Ely is also conducting studies on quantitative and qualitative changes in the mouse pituitary gland following total body irradiation.

Dr. Firschein is preparing a series of papers on populating genetics based on a five year study of the isolate-Black Caribs of British Honduras, Central America.

Professor Emanuel B. Kaplan is continuing his studies on the morphology and comparative anatomy of the foot and knee. He is also completing a book on surgical approaches to the extremities and spine.

Professor Melvin L. Moss is engaged in two main lines of investigation: cranial morphogenesis and physiology of acellular fish bone. His studies have further clarified the role of the several extrinsic factors in the determination of skull form and the interdependence of the osseous and func-

tionally related soft tissues. Studies on the racial significance of cranial morphology were aided by a field trip to several Latin American areas. Professor Moss's work on acellular fish bone indicates that the mode of osteogenesis is by intracellular calcification, accompanied by a break-down of the cells. An analysis of the distribution of this tissue among tropical fishes was aided by two field trips to the Lerner Marine Laboratory, Bimini, Bahamas.

Research in Professor Margaret R. Murray's tissue culture laboratory has followed two main lines of study: 1) the etiology of mammary carcinoma; and 2) problems of development, maintenance and regeneration of nervous tissue. In collaboration with Dr. Etienne Lasfargues, Assistant Professor of Microbiology, and with Professor Dan Moore of the Rockefeller Institute, the viral agent of the mouse mammary carcinoma has been identified and propagated in tissue cultures of embryonic and adult mammary gland. The research on nervous tissue involves the use of *in vitro* methods which allow small portions from brain, cord and dorsal root ganglia to develop for long periods under continuous microscopic observation. Dr. Murray Bornstein and his associates produced demyelination in cultures of rat cerebellum by administering serum from rabbits in allergic encephalomyelitis. Mrs. Edith R. Peterson has studied the effects of diphtherial toxin upon myelinated fibers. Dr. Takeshi Yonezawa, a Visiting Fellow from Japan, demonstrated a spatial distribution of oxidative enzymes during myelin formation.

Professor Charles R. Noback has continued his comparative anatomical program by a study of the brain stem of the platypus — an animal with a unique phylogenetic origin. In collaboration with Dr. Dominick P. Purpura, Associate Professor of Neurological Surgery, Professor Noback has been studying the neocortex of the cat. This is part of a program for analyzing the development of the cortex by morphological, neurophysiological and pharmacological methods.

Professor Pappas has continued his work in electron microscopy with a primary interest in problems of fluid transport. In collaboration with Professor George K. Smelser and Dr. Brandt Professor Pappas has studied aspects of aqueous humor dynamics. With Dr. Anthony Donn, As

sistant in Ophthalmology and Assistant Ophthalmologist, and Mr. Gordon I. Kaye, the fine structure of corneal epithelium is being studied in relation to fluid transport. In collaboration with Dr. Tennyson, Dr. Pappas has studied the fine structure of the choroid plexus and aspects of the blood-brain barrier. Information has been obtained on fluid movement in ameba, in relation to pinocytosis. Other studies include high resolution micrographs of the helicies found in the nucleus of *Amoeba proteus*. Work in the electron microscope laboratory has been aided considerably by the addition of a new microscope purchased with funds made available by a grant from the National Institutes of Health.

Professor William M. Rogers is continuing a program which aims to establish phonocardiographic criteria useful in the diagnosis of congenital and acquired cardiovascular lesions. In addition to clinical cases, the program includes a study of several types of surgically created lesions in dogs. Co-investigators include: Dr. James R. Malm, Assistant Professor of Surgery and Assistant Attending Surgeon, Dr. James S. Harrison, Instructor in Anatomy, Dr. Yousif Al-Naaman, Research Associate in Surgery, Dr. Ali K. Maksad, Fellow from Lebanon and Drs. Erwin and Edith Simandl, research workers in surgery. Dr. George H. Humphreys, II, Valentine Mott Professor of Surgery and Director of the Surgical Service has sponsored and collaborated in the program.

Professor Shih-Chang Shen has continued his research on the cytochemistry of synaptic differentiation. The most significant observation made thus far shows that the synthesis of acetyl-

cholinesterase at the synapse is initiated not by the nerve but by the muscle. Furthermore, experimental evidence indicates that the enzymatically active portion of the synapse is probably derived from the fibrous component of the sarcolemma. Unequivocal evidence is being sought by current studies of cytogenesis of the synapse by the use of electron microscopy.

Investigations in the laboratory of Professor Smelser include the following: the "turnover" rate of mucopolysaccharides studied by means of autoradiography; exophthalmos, in relation to the effects of steroid hormones; uveal mast cells,—their number and distribution after inflammation; fate of grafted corneal tissue, labelled by C₁₄.

Professor Copenhaver is continuing a study of cytodifferentiation of cardiac muscle, utilizing methods of histochemistry, autoradiography, and electron microscopy in collaboration with Professor Pappas. In collaboration with Dr. Roberts Rugh, Associate Professor of Radiology, Professor Copenhaver is also continuing studies of the effects of x-irradiation on cardiovascular tissue.

Acknowledgments

The research work of the various members of the Department has been aided by grants from the American Heart Association, Dunlevy Milbank Foundation, Helen Hay Whitney Foundation, Robert Chuckrow Construction Co., Inc., National Science Foundation, Squibb Institute for Medical Research and several divisions of United States Public Health Service.



Anesthesiology

EMANUEL M. PAPPER, *Professor and Chairman of the Department
Director of Service*

Professor M. Jack Frumin resigned to join the Department of Anesthesiology at Jefferson Medical College in Philadelphia. Dr. Harold J. Corder resigned to enter the private practice of anesthesiology in New York City. Dr. Richard S. Matteo returned to the attending staff after two years of military service in the Air Force. Drs. Aaron J. Gissen and Richard J. Kitz were appointed to the attending staff upon completing their residency in anesthesiology in the department. Dr. Joannes H. Karis joined the department upon completion of his residency and fellowship in anesthesiology at the Downstate Medical Center of the State University of New York.

Professor Lester C. Mark was on sabbatical leave at the University of Copenhagen, assigned to the Bispebjerg Hospital in that city. The department is particularly proud of the fact that Professor Mark was awarded both Fulbright and Guggenheim Fellowships for his research work in Copenhagen.

The training grant awarded by the National Institutes of Health continues to help in the preparation of anesthesiologists for academic careers in anesthesiology in an effective way. Dr. Charles E. Wolf is assigned to the Department of Physiology under the supervision of Dr. Walter S. Root, Professor of Physiology. Dr. Mieczyslaw Finster is assigned to the Department of Anatomy under the supervision of Dr. Frederick J. Agate, Jr., Associate Professor of Anatomy. Dr. Stuart F. Sullivan is a Research Fellow under Dr. Andre Cournand, Westchester Heart Association Professor of Cardiovascular Research and Visiting Physician at Bellevue Hospital.

During the year the Medical Board and the Administration approved an increase in size of the department to enable it to fulfill its mission of patient care, teaching, and research in a more effective way than had been possible previously. So far, the formula for staff size established by the Medical Board has worked satisfactorily.

Teaching Activities

With the support of the National Institutes of Health, the department has invited distinguished anesthesiologists from other institutions to work with us in the laboratory and in the teaching program. This year the Visiting Professors on the clinical service have been Dr. John Adriani, Director of the Department of Anesthesia at the Charity Hospital of Louisiana, Dr. James O. Elam, Director of the Department of Anesthesiology at the Roswell Park Memorial Institute in Buffalo, Dr. Henning Ruben, Head of the Department of Anesthesiology, Finseninstitutet og Radiumstationen in Copenhagen, and Dr. Harry C. Churchill-Davidson, Consultant Anaesthetist at St. Thomas' Hospital, London. Each of these distinguished anesthesiologists spent a week in the department working with the residents to give them the benefit of their knowledge about clinical practices. The department has also been fortunate in having Dr. Martin Holmdahl, Associate Professor in Physiology at Uppsala University, spend the major portion of an academic year with us in the research laboratories. Professor Holmdahl has also educated us in the uses of a respirator care unit based upon his extensive experience in the study and treatment of respiratory insufficiency in Sweden. He has also been of inestimable value in the anesthetic care of patients subjected to open heart surgery. We were fortunate, also, in having Dr. Henri Reinhold from the University of Brussels for a period of two months, collaborating with Professor B. Raymond Fink in the latter's research activities.

In addition to these visiting anesthesiologists the members of the department have met a large number of anesthesiologists from all parts of the world who have come either before or after the meeting of the World Federation of Societies of Anesthesiology in Toronto. All told, 145 foreign anesthesiologists have visited the department this summer and fall.

The teaching of medical students has been re-

vised for students in the third and fourth years within the limits of available time. A course in resuscitation is given to the third year class as a part of the course in public health and preventive medicine. The seminar series for the third year has been revised with a somewhat stronger emphasis on clinical problems. The practical assignment to the operating rooms this year has also changed in that students are assigned singly or in pairs to individual attending anesthesiologists. The fourth year program is still not properly developed in that approximately sixty per cent of the students in the fourth year have no anesthesiology clerkship. The remaining forty per cent have a clerkship of one week.

Research Activities

Professor Gabriel G. Nahas, Professor Holmdahl and Dr. Driss Hassam have studied the comparative effects of organic (THAM) and inorganic (sodium carbonate) buffers in the treatment of acute hypercapnic acidosis. They also studied the acid-base relationship in the blood and the cerebral spinal fluid under conditions of constant acid load, buffered with organic and inorganic compounds. Professors Nahas and Holmdahl studied the volume of distribution of THAM using C_{14} tagged material kindly provided for us by the Abbott Laboratories. Dr. Jose Strauss, Fellow in Pediatrics, studied the effect of THAM on kidney function in relation to salicylate excretion and glucose reabsorption. Professor Nahas and Dr. William M. Manger, Instructor in Medicine and Assistant Physician, have continued studying the problems and mechanisms of transfusion acidosis in relation to adrenal function and acid-base balance. Professor Nahas, in collaboration with Dr. David V. Habif, Associate Professor of Clinical Surgery and Associate Attending Surgeon, has undertaken a study of the effects of buffering blood when given in large amounts, to selected patients.

Professor Shih-Hsun Ngai has continued his interest in the mechanisms of control of the respiratory center. In collaboration with Professor Nahas, Dr. Shih-Chun Wang, Professor of Pharmacology, and Dr. Ronald Katz, Professor Ngai studied the effect of changes in acid-base balance on respiratory movements in the decerebrate cat.

In other studies of various respiratory centers

in the brain stem it was concluded that hydrogen ions in an appropriate concentration or carbon dioxide is essential for the initiation of respiratory rhythm.

Professor Ngai and his associates are studying the relationship between acid-base balance and the strength of electrical stimulus to respiration. Studies thus far indicate that the withdrawal of the carbon dioxide drive by buffering with THAM makes it necessary to increase the electrical stimulus strength in order to cause an inspiratory response.

Professor Ngai, in collaboration with Professor Edgar C. Hanks, is studying a new fluorinated ether, methoxyflurane. Professors Ngai and Hanks have shown that this agent may prove to be a useful addition to clinical practice. It is non-explosive and relatively non-potent because of its low vapor pressure. Induction of anesthesia and emergence may be slow but these drawbacks are not serious. Of particular interest is the profound muscular relaxation it produces with the lack of cardiac irregularity during its administration. The mechanism for the muscular relaxation observed during methoxyflurane anesthesia has been examined in decerebrate cats.

Professor Ngai has also studied the effect of thiamine and thiamine analogues on neuromuscular transmission in the cat. He found, in collaboration with Dr. Katz, and Dr. Sarah Ginsburg, Research Associate in Neurology, that thiamine has an effect upon the neuromuscular junction which resembles that of d-tubocurarine.

Professors Fink, Hanks and Ngai studied the effect of fluothane on the CO_2 stimulus-ventilatory response in man. It was demonstrated that the apneic threshold for CO_2 was elevated with increasing depths of fluothane anesthesia and the end tidal pCO_2 was also elevated and associated with a reduced volume of ventilation. These studies with the newer method are to be extended to include other anesthetic and analgesic agents.

Professor Charles C. Wycoff has continued his studies of differential cerebral hypothermia. The method has been developed to the point where several dogs have now survived with no important untoward effects. The temperature of the brain is reduced to ten degrees centigrade for one hour and the rest of the body maintained at twenty-eight degrees or slightly lower. These

studies are designed to develop a practical method for interrupting the circulation to the brain for neurosurgical procedures for substantial periods of time.

Professor Wycoff is also continuing his studies of the toxic and lethal dose of acetyl strophanthidin in the dog. Preliminary results suggest that the toxic dose in the animal with respiratory alkalosis induced by hyperventilation is fifty per cent of the dose of the animal with normal spontaneous respiration.

Professor Jean Henley at the Francis Delafield Hospital has presented a report on the effect of total sympathetic blockade during clinical anesthesia. Interest in this problem has stimulated several physicians in the Departments of Anesthesiology, Surgery and Medicine to measure circulating blood volume and visceral regional blood flows.

Professor Fink has continued his studies of the physiological regulation of the muscles of respiration. He has demonstrated that a substantial portion of the resting ventilation in man is sustained by activity that requires a state of wakefulness, regardless of the CO_2 tension in the blood. During sleep or general anesthesia the wakefulness stimulus is replaced by increased stimulation from retained carbon dioxide. Early experiments in animals performed by Professor Fink in collaboration with Dr. Katz and Dr. Arnold Schoolman of the Department of Neurological Surgery, indicate that the site of action of the wakefulness or respiratory stimulus is in the rostral mid-brain. Professor Fink, in collaboration with Dr. Reinhold of the University of Brussels, has explored the central action of hypoxia in animals. Professor Fink, in collaboration with Dr. Elam, also studied the threshold for carbon dioxide during cyclopropane anesthesia.

Dr. Katz collaborated with Professors Ngai and Fink in showing that the integrated electromyogram correlates very well with the tidal volume of respiration provided no obstruction to breathing is present. The chief use of this method is in those instances where a quantitative index of ventilation is required but where the inspired or expired volume cannot be measured directly with accuracy.

Dr. Katz, in collaboration with Professors Ngai and Irwin B. Wilson of the Department of Neu-

rology, studied the action of pyridinium dodecyl iodide for permanent nerve block. This agent penetrates the myelin sheath and is a permanent depolarizer. However, the dose used to produce permanent depolarization is also lethal and the project was therefore abandoned.

Dr. Katz, in collaboration with Professor Ngai, studied the central respiratory effects of ether in the cat. They showed that the explanations previously proposed to explain the respiratory effects of ether are incomplete.

Dr. Katz, in collaboration with Dr. Norman Kahn and Dr. Herbert Bartelstone, Assistant Professor of Pharmacology, studied the effect of variations of pH on the activity of local anesthetic agents. They showed that the admixture of THAM with procaine produced a potentiation of the local anesthetic action. They are also studying the possibility of adding a proton donor to decrease the activity of a previously administered local anesthetic agent with the idea of reducing the discomfort of prolonged local anesthesia after its need has passed. Dr. Katz has begun a study with Dr. Matteo on the incidence and nature of arrhythmias during trichlorethylene anesthesia.

Professor Robert M. Epstein, in collaboration with Professors Nahas and Lester C. Mark, studied the effects of rapid correction of severe hypercapnic acidosis in the dog. THAM was used to correct the acidosis. In contrast to the work of Drs. Brown and Miller of the University of Minnesota, these investigators showed that the dog does not develop ventricular fibrillation but develops cardiac arrest under these conditions. There was a severe fall in plasma sodium and a rise in plasma bicarbonate and total carbon dioxide as CO_2 appeared to be withdrawn from intracellular sites. The myocardial depression which resulted in cardiac arrest could be corrected by the administration of calcium chloride.

Professor Epstein, in collaboration with Professor M. Jack Frumin, extended the studies on apneic oxygenation by observing the effects of a three-minute period of apnea in room air after oxygen breathing on the oxygen saturation of the blood. This situation simulated clinical circumstances after intubation of the trachea. No desaturation was found after three minutes in any patient and it was concluded that this is a safe procedure in adults with normal lungs.

Professor Epstein with Professors Herbert Rackow and Ernest Salanitro studied the problem of pulmonary exchange of inert gases. They were interested in determining whether or not depressant drugs and the anesthetic state resulted in pulmonary gas excretion curves that were different from those that were obtained from subjects who were unanesthetized. The use of sub-anesthetic concentrations of nitrous oxide (ten per cent) provided an effective tool for this purpose. Breath-by-breath analysis of nitrous oxide and carbon dioxide were performed and uptake and excretion curves were constructed from the data. The excretion curves in these conscious subjects were not essentially different from those of unanesthetized patients. It was also shown that the uptake curve for nitrous oxide was identical with the excretion curve in unanesthetized patients. These experimental findings corroborate the mathematical predictions of Dr. Seymour Kety of the National Institutes of Health. Professors Epstein, Rackow and Salanitro together with Dr. Kitz are now directing their investigations to pulmonary gas exchange in young children. Preliminary work has indicated that the excretion curve of nitrous oxide is similar in shape to that of the adult but that the slope of the curve is steeper.

Professor Frank Moya, in collaboration with Dr. L. Stanley James, Assistant Professor of Pediatrics, has begun a study of the acid-base status of mothers during labor and delivery, with particular relationship to the state of analgesia or anesthesia. The attempt will be made to study the relationship of acid-base changes in the mother with the changes produced in the fetus as determined by fetal electrocardiography and the biochemical changes in the fetus at birth. This study grew out of an ancillary project in the Collaborative Study of Cerebral Palsy. Thus far, studies during high spinal anesthesia indicate that the mothers did not develop acidosis even though, on some occasions, they actually were dyspneic as the result of the high spinal block.

Professor Moya, in collaboration with Dr. Bradley Smith, Visiting Fellow (American), and Dr. Sol M. Shnider, recently completed a study of liver function in full term pregnancy. Eighty per cent of a group of ninety patients had abnormal B.S.P. retention prior to anesthesia. Following

delivery, the function of the liver improved regardless of the type of anesthesia used. It was concluded that the liver in pregnancy is not predisposed to damage by anesthetic agents, even including chloroform. This finding is in conflict with the clinical impressions of others.

Professor Moya is collaborating with Drs. Peter Dayton of the National Institutes of Health and Professors Mark and James in a study of the placental transfer of thiopental and the metabolism of this drug in the newborn infant.

Professor Herman Schwartz is continuing his study of the oculo-vagal reflexes during operations upon the eye. Studies in animals were not productive and a controlled study in patients has been undertaken. The incidence of this reflex response is reduced by the deepening of general anesthesia.

Dr. Shnider reviewed the published cases of amniotic fluid embolism. He found, at the Sloane Hospital for Women, that this complication was the most common cause of obstetrical death during labor, delivery, or the immediate postpartum period. Dr. Shnider, in collaboration with Professor Moya, is studying the effect of maternal premedication on the clinical condition of the newborn infant. Five hundred records have been reviewed but insufficient data have been accumulated to make any conclusions at the present time. Dr. Shnider studied 687 anesthetics administered to patients with bronchial asthma during a period of a little more than two years. The findings thus far indicate that fluothane is as satisfactory as and probably superior to ether for the establishment of general anesthesia in an asthmatic patient and in the treatment of bronchiolar spasm should it occur. Dr. Shnider found also that the most common single anesthetic factor which precipitated an acute attack of asthma during operation in an asthmatic patient was the introduction or the presence of an endotracheal tube. This finding does not contraindicate the use of endotracheal airways where indicated but suggests that the patients must be maintained in the satisfactory depth of anesthesia to tolerate the tube.

Professor Cyril Sanger, in conjunction with Dr. William B. Seaman, Professor of Radiology and Director of Radiology Service, Dr. Norah duV. Tapley, Assistant Professor of Radiology and As

sociate Attending Radiologist, and Dr. Harold L. Atkins, Instructor in Radiology and Assistant Radiologist, studied the use of high pressure oxygen in radiation therapy. Professor Sanger, in collaboration with Professor Nahas studied the effects of THAM on the production of convulsions in mice, which were subjected to high pressures of oxygen. It was shown in preliminary experiments that THAM appears to have a protective action against convulsions. The mechanism of this action is being investigated further.

Professor James and Dr. Eric D. Burnard have continued their investigations into the physiology of the newborn. Their studies have been concerned with the effect of the birth process on the biochemical and cardiovascular adjustments of the newborn. These physiological findings have been compared with clinical assessments of the baby at birth. Professor James and Dr. Burnard have continued the radiographic study of the newborn chest to evaluate the differences in the size of the heart in relation to the differing circumstances which surround the birth process. They have also begun a study on renal function in the immediate newborn period with the assistance of Dr. Strauss. Inulin and PAH clearances have been utilized in these studies. Cardiac murmurs in the newborn period have been recorded by phonocardiography. Intracardiac recordings have also been carried out with phonocatheters. These observations will be correlated with the studies mentioned previously in this report to evaluate the clinical signs which appear in unhealthy newborn infants, as well as to provide a more complete description of the physiological events at birth.

Professor Vance Lauderdale has continued his studies of mortality due to anesthesia. Careful documentation is being maintained in a record system of all deaths which follow the administration of anesthesia. The department's record for mortality is exceedingly gratifying but efforts must be made constantly to minimize and, if possible, eliminate deaths due to anesthesia.

Professor Mark, in collaboration with Professor Leonard Brand, and Drs. Dayton and John Burns of the National Institute of Health, have continued their studies on the physiological disposition of various intravenous anesthetic agents. The studies on methitural were completed and

the physiological disposition of this agent defined. Studies are currently in progress on methohexital which appears to be more quickly metabolized than thiopental and less soluble in body fat. Several experiments were performed to detect the tissue uptake of thiopental and pentobarbital by measuring A-V differences in man. Studies thus far indicate a slower uptake of pentobarbital than thiopental. This finding may explain in part the difference in the dynamics of distribution after intravenous injection. Studies on the blood/brain and blood/spinal fluid barriers are continuing with barbital as the chemical indicator because of its uniform distribution in total body water. It was noted that barbital passes slowly into the brain and even more slowly into the cerebrospinal fluid. It is possible that the blood/cerebrospinal fluid barrier and the blood/brain barrier are similar for this drug. The passage of barbital into ocular fluid is now being studied as a further example of the whole phenomenon of barrier penetration.

These investigators are studying the effects of convulsions produced by procaine in curarized ventilated dogs. Isolated convulsions which are not treated appear to cause no harm to the animal. However, five convulsive episodes a week apart cause death of the animals after the fifth week. The animals die either of respiratory or cardiac failure. This preparation for studying the effects of convulsions lends itself to a screening device for the study of anti-convulsants which will be followed, in collaboration with Dr. Burns.

Professor Mark is studying the effects of acid-base balance disturbances during attempts at suicide in patients in the Poison Center at the Bispebjerg Hospital.

Dr. Sullivan is studying the change in ventilation perfusion ratios in the lung, in patients recovering from pulmonary insufficiency. These studies are under the direction of Dr. William A. Briscoe, Assistant Professor of Medicine (Bellevue), in Professor Cournand's cardiopulmonary laboratory at Bellevue Hospital. Dr. Wolf, under the supervision of Professor Root, and in collaboration with Dr. Elizabeth Gerst, is studying the degree of hypoxic stress necessary to elicit significant sympathoadrenal activity in dogs with a chronically denervated heart. Dr. Finster, under the supervision of Professor Agate, is studying

temperature control in a cold environment in the normal rat and in hypophysectomized rats with and without hormonal replacement. He is also studying, in the Premature Nursery Unit of Babies Hospital, the optimal rate of rewarming of premature infants and the optimal temperatures for their survival. These studies are under the supervision of Professor Agate and Dr. William A. Silverman, Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician.

Statistics

During 1960 22,930 patients were anesthetized for surgical operations. General anesthesia was used for 18,158 patients and regional anesthesia for 4,772. Muscle relaxants were employed on 8,062 occasions. There is, therefore, a continued increase in the volume of responsibility on the clinical service. Fifteen patients were treated in the Nerve Block Clinic.

Improved or New Methods of Patient Care

There were several changes of consequence in methods for the anesthetic care of patients. Some of these methods arose from laboratory investigations and others were the result of clinical trial. For example, as a result of the studies of apneic oxygenation, a method of permitting laryngoscopy and certain operative procedures upon the airways was developed. The apneic technique for laryngoscopy and bronchoscopy has become a practiced clinical procedure and has been reported by Dr. De Graaf Woodman, Clinical Professor of Otolaryngology and Attending Otolaryngologist. Professor Rackow developed a method of increased safety in the administration of inhalation anesthetic agents. He established a method for metering gases in a fixed ratio, with the engineering assistance of Mr. Arnold Lee. This led to an improved flow meter system in which gas flows are arranged in such a manner that a failure of oxygen flow automatically makes all other gas flows fail. It is, therefore, not possible with this arrangement to cause inhalation anoxia as the result of malfunction of flow meters of gases. This system of anesthesia has been instituted in the Babies Hospital operating rooms and has proved successful. In this connection, a new gas machine has been designed by several members of the department, with leadership in this direction exer-

cised by Professors Lauderdale and Hanks. The "fail/safe" principles developed by Professor Rackow have been incorporated in this new gas machine. The anesthesia apparatus is now undergoing final test trials. When completed it should provide a very useful addition to the care of patients, both in this institution and elsewhere. The Ohio Chemical Company, which has engineered the development work, plan to make this apparatus available for practical clinical use. This adaptation of a research instrument to clinical practice has proven useful in the Neurological Institute where the volume of the brain is extraordinarily sensitive to increased tensions of CO₂. The results for the care of patients thus far have been most satisfactory.

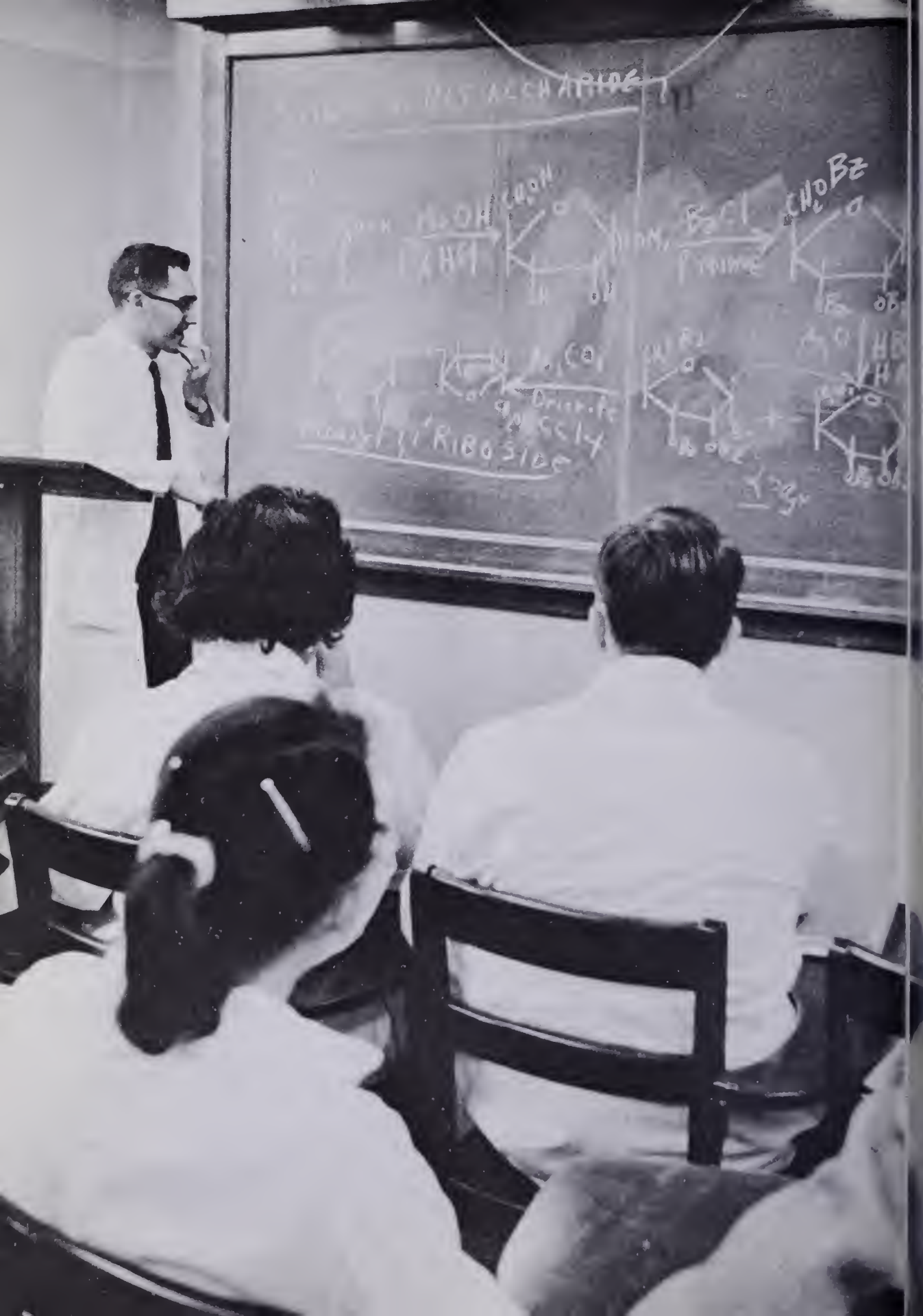
Professor Hanks and Dr. Ferdinand F. McAllister, Assistant Clinical Professor of Surgery and Associate Attending Surgeon, and Dr. Hamilton Southworth, Clinical Professor of Medicine and Attending Physician, have visited Johns Hopkins Hospital to learn the details of the closed chest resuscitation methods. They will undertake teaching exercises of this method for members of the attending and house staffs at the Medical Center. Dr. Kitz has developed a new screen for pediatric anesthesia and also an improved record for nerve block purposes.

Acknowledgments

Particularly grateful acknowledgment for support of research in anesthesiology is made to the National Institutes of Health, the United States Public Health Service, the Department of the Army, the National Aeronautics and Space Administration, the Burroughs-Wellcome Fund, Abbott Laboratories, the Josiah Macy, Jr. Foundation, and Smith, Kline & French.

Other Activities

Professor Nahas organized a conference under the New York Academy of Sciences on organic buffers. Professor Papper served as General Chairman of the annual meeting of the American Society of Anesthesiologists in New York City, participated in the organization of national conferences on anesthetic matters under the National Institutes of Health and the National Research Council. He was elected a Vice-President of the American Society of Anesthesiologists.



Biochemistry

DAVID RITTENBERG, *Professor and Chairman of the Department*

Instruction in biochemistry has been given to the first year medical and dental classes and to forty-one students under the Graduate Faculties. Of the latter, thirty-two had their major interest in biochemistry, nine in other departments of the University. In addition, close to twenty post-doctoral fellows are receiving training in the department. This latter aspect of the teaching function of the department is rapidly increasing in scope. The course of instruction in biochemistry for the medical and dental students has been modified to train the students in the more recent aspects of biochemistry.

Professor Maxwell Karshan, having retired from teaching the dental students after thirty-seven years, has been replaced by Professor Max A. Eisenberg.

All the members of the department have an active research program. Support has largely come from outside sources. The volume of research support has now exceeded the physical absorptive capacity of the department; increase of research would result in a diminution of teaching.

Professor David Rittenberg has continued his investigations on the source of the oxygen atoms of the proteins of bacteria and on the isolation of the enzyme hydrogenase. He has been assisted in this work by three visiting scholars, Dr. Emanuel Riklis of Israel, Dr. Ljerka Purec of Yugoslavia and Dr. Raghunandana Rao of India.

Professor Erwin Chargaff continued and expanded his studies in the following fields: chemistry and biology of nucleic acids; chemical mechanisms involved in cell differentiation; mode of formation of bacteriophages; chemistry of the mucolipids and other complex brain constituents. These studies were carried out in collaboration with Drs. George Brawerman, Fred Goodman, Jack Horowitz, Abraham Rosenberg and Herman S. Shapiro. A number of visiting scholars also took part in the work, among them Dr. A. K. Gosh of Calcutta University (India), Dr. Ernest D. Gray of the University of Glasgow, Dr. E.

Okuhara of the University of Sapporo (Japan), Dr. A. O. Pogo of the University of Cordoba (Argentina), Dr. John H. Spencer of McGill University.

The biochemistry laboratory at the Francis Delafield Hospital under the direction of Professor Samuel Graff has continued research on the biochemical characteristics of cancer and the environmental and hormonal influences on metabolic events in isolated cells as well as intact animals. Professor Graff has been assisted by Professors Horace B. Gillespie and Aaron Freedman, Drs. Kathc M. Liedke and Herman Moser and Mrs. Ada M. Graff.

Professor Reinhold Benesch joined the department this year. Since his arrival in February he has investigated the properties of hemoglobin H and the structural basis of the Bohr Effect. He has been assisted in this work by Dr. Ruth E. Benesch. Professor Reinhold Benesch participated in the graduate course on the proteins in the medical student teaching.

Dr. Ernest Borek has continued his researches on the biochemical mechanism which results in cellular damage from radiation energy. As a model system he has studied the mechanism of the conversion of a latent bacterial virus to virulence by ultraviolet or X-radiation. The radiation effects seem to be expressed through a stable product of irradiation which can be transferred from cell to cell without loss of biological activity. Studies on the function of RNA in the cell and the mechanism of protein synthesis are continuing. Dr. Elsie Wainfan was associated with him in this work.

Professor Eisenberg has supervised the teaching of biochemistry to the dental students and is in the process of revising the curriculum. He has been assisted in teaching by Professor Gillespie. Professor Eisenberg is studying the mechanism of biotin biosynthesis.

Professor Alvin I. Krasna has continued his studies on the inhibition of enzyme systems by fluoromalic acid. This compound was found to

be a competitive inhibitor of fumarase and malic dehydrogenase. The adaptation of the enzyme hydrogenase in photosynthetic algae and the action of light on this process has also been investigated. In collaboration with Professor Rittenberg and Dr. Purec, he has studied the effects of light on the reversal of the carbon monoxide inhibition of hydrogenase.

Professor Barbara W. Low's X-ray crystal structure studies of the protein hormone, insulin and the protein hormone oxytocin are continuing. The aim of the research is the determination of the complete molecular structure of these compounds. Professor Low has given a course on the "Introduction to X-ray Crystallography" and has assisted in the course on "The Proteins." Dr. Low has been assisted in her research work by Drs. Wolfie Traub, J. Ralph Einstein, W. Kenneth Grant and George I. Birnbaum.

The laboratory of Professor David Shemin has been engaged in several research programs. In collaboration with Professor Keizo Tsushima, visiting scholar from The Nippon Medical School, a study of the mechanism of enzyme repression and a study of the *in vitro* synthesis of enzymes has been investigated. In collaboration with Dr. Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist, he has investigated the metabolism of β -methyl aspartate, a product of rearrangement from glutamic acid by a B_{12} enzyme. It was found that β -methyl aspartate is converted to isoleucine in *E. coli*. Also they have studied the metabolism of ϵ -aminolevulinic acid in order to gain some insight on the metabolic block in acute porphyria. With Mr. Richard Bray, he has found that the methyl groups of vitamin B_{12} arise from methionine and with Miss Tessa Abramsky that succinate induces photosynthetic bacteria to synthesize enzymes concerned with chlorophyll synthesis.

Professor David B. Sprinson and co-workers investigated the late stages of the biosynthesis of the aromatic amino acids; the resolution of β -amino-isobutyric acid- N^{15} , and its biochemical behavior in human subjects; the synthesis of folic acid derivatives of biological interest. Collaborating on these problems were Drs. Irving Borowitz, Mary Chalmers, Mary J. Clark and Milon Sprechter.

Professor Parithychery R. Srinivasan has con-

tinued his studies on the biosynthesis of anthranilic acid and p-aminobenzoic acid. Using N^{15} labelled glutamine he has demonstrated that the amino group of p-aminobenzoic acid is derived from the amide N of glutamine. Analogues of glutamine such as azaserine, 6-diazo-5-oxo-L-norleucine also inhibit the above reaction. In collaboration with Dr. Doy, he has obtained evidence for the formation of N-(5'-phosphoribosyl)-anthranilic acid from anthranilic acid and 5-phosphoribosyl-pyrophosphate in cell free extracts of *E. coli* mutants. These studies have strengthened the role of anthranilic acid as a true intermediate in the biosynthesis of tryptophan. He has initiated studies on the biosynthesis of magnamycin — a macrolide antibiotic.

Professor Stephen Zamenhof, in collaboration with Drs. Sheldon Greer, Erela Elizur and Roger Mantsavinos, has conducted studies on the biosynthesis of thymidylic acid, on the effects of 5-bromouracil and of deuterium in bacterial DNA, and on new polysugarphosphates. Professor Zamenhof has taken part in the teaching of the course in genetics to the medical students.

Dr. Gerald Phillips has studied serum and tissues for unknown phospholipids and estimation of the individual phospholipids in the serum and red blood cells of patients with diseases, especially those associated with hyperlipemia. He has analyzed bile and chyle for individual phospholipids. Dr. Phillips has assisted in the class and clinic instruction of the medical students.

The departmental seminars were addressed by distinguished visitors, among whom were Clifford A. Bunton, University College, London; Max F. Perutz, Cambridge University, England; Lewis A. Pizer, University of Pennsylvania; R. B. Loftfield, Massachusetts General Hospital; George Ivanovics, University of Szeged, Hungary; Jonathan Wittenberg, Albert Einstein College of Medicine; Austin L. Shug, Veterans Administration Hospital, Madison, Wisconsin; Albert Neuberger, St. Mary's Hospital Medical School, London; H. Hoffmann-Berling, Institute for Physiology, Heidelberg; Francois Grocs, Pasteur Institut, Paris; E. A. Evans, Jr., University of Chicago; J. Halpern, University of British Columbia, Vancouver; T. C. Bruice, Cornell University, Ithaca, Martin Flavin, National Institutes of Health; Michael Sela, National Institutes of

Health; D. E. Koshland, Jr., Brookhaven National Laboratories; Ernest B. Chain, Istituto Superiore di Sanita, Rome; and Vasilii N. Bukin, Academy of Sciences, Moscow.

Acknowledgment

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Dental and Oral Surgery

GILBERT P. SMITH, *Dean of the Faculty of Dental and Oral Surgery*
Director of Service

The University academic year of July 1, 1959, to June 30, 1960, was the first to be completed under the direction of the re-constituted Faculty of Dental and Oral Surgery. The transition was smooth and the educational, and the clinical and research programs have continued on the previous high level.

During the calendar year 1960, there were numerous changes in the School staff. We report with sorrow the death of Dr. George Schwen-dener, who served on our staff from 1952 until his resignation, June 30, 1960. He was a devoted teacher and beloved by all of his students and colleagues.

Professor Carl R. Oman, who has served the University for twenty-four years, and was Director of the Division of Operative Dentistry since 1945, retired, June 30th. Dr. Oman has contributed much to the tradition and quality of operative dental service at Columbia.

Professor Maxwell Karshan, who joined the staff of the School of Dental and Oral Surgery as a teacher of biochemistry in 1917, also retired at the end of the academic year. His service to the University has been continuous, first in the Department of Dental and Oral Surgery until 1945, and then in the Department of Biochemistry. Professor Karshan, one of the pioneers in dental biological research, was awarded the Columbia Dental Alumni Research Award at the Dean's Day exercises in February, 1960.

Professor William J. Savoy resigned the Directorship of the Division of Oral Surgery and his post was filled temporarily by Professor Emeritus Bion R. East. Dr. Rudolph H. Friedrich, former Secretary of the Council on Dental Health of the American Dental Association, was appointed Professor of Dentistry and on June 1, 1960, assumed the Directorship of the Division of Oral Surgery.

The following promotions were effective July 1, 1960: Dr. Edward A. Cain, Jr., from Associate Professor to Professor; Dr. Robert E. Herlands

from Associate Professor to Professor; Dr. Frances A. Stoll from Associate Professor to Professor; Mrs. Patricia McLean from Instructor to Assistant Professor of Oral Hygiene; Dr. Irwin D. Mandel from Assistant Clinical Professor to Associate Clinical Professor; and Dr. Austin H. Kutscher from Assistant Clinical Professor to Assistant Professor.

New appointments to the School staff were: in the Division of Oral Surgery, Drs. Herbert Fink and Ronald J. Hanft as Volunteer Clinical Assistants; in the Division of Orthodontics, Drs. Gerald A. Finkelstein, Henry J. Seligman and Irwin Steur as Clinical Fellows; in the Division of Restorative Dentistry, Drs. Victor Auth, William Dwyer, Eugene Jacoby, James Moffa and George Rudensky as Volunteer Clinical Assistants; in the Division of Stomatology, Section of Diagnosis, Drs. Herbert Edelstein, William Harnett, David Hendell, Arthur Kahn, Frances Karlan, John J. Lind, Frank Miele and Norman Roland as Volunteer Clinical Assistants; in the Section of Radiology, Dr. Nicholas R. Napoli as Clinical Assistant, and in the Section of Periodontology, Drs. Sheldon Benjamin, Pasquale C. Gabriele, Irving Karel, Robert O'Connell and Bernard Telsey as Volunteer Clinical Assistants.

Dr. Howell O. Archard resigned from the Division of Stomatology to accept a research fellowship in pathology at the National Institute of Health in Washington, D. C. Other resignations in the Division were Assistant Clinical Professor Jesse L. Lefcourt, Drs. Joseph Serio and James O'Connor.

The staff was active in extramural dental activities during the year. Professor Stoll presented a lecture before the Pan-Pacific Dental Conference in Honolulu, Hawaii; Professor Francis J. Loughlin presented an essay before the Journées Dentaires Internationales in Paris, France; Professor George W. Hindels was a principal lecturer at the annual meeting of the Swiss Dental Society in Zurich, Switzerland; and Professor Louis A.

Cohn lectured before the 100th Swedish Dental Conference in Stockholm, Sweden.

Two hundred and nineteen lectures and clinics and twenty-one short courses were given before dental groups throughout the United States by various members of the staff. Forty-eight papers written by the staff were published in scientific journals. Three textbooks were published: *Dental Health and Education* by Professor Stoll; *Minor Tooth Movement in General Practice* by Professor Leonard Hirschfeld; and *An Introduction to Periodontia* by Professor Lewis Fox.

Among important offices held in dental organizations by various staff members were: Professor Nicholas A. Di Salvo, Secretary of Association of Dental Alumni of Columbia University; Professor Loughlin, Chairman of the American Dental Association's Section on Orthodontics and Oral Development, Delegate for Tenth District of New York to American Dental Association and President of Central Queens Dental Society; Professor Solomon N. Rosenstein, Co-Chairman of the Dental Guidance Committee of United Cerebral Palsy of New York State, Inc., and member of Dental Advisory Committee of the New York City Department of Health; Professor Thomas W. Portway, Secretary of the Operative Dentistry Section of the First District Dental Society; Professor Hindels, Chairman of the Prosthetic Section of the First District Dental Society; Professor Gilbert P. Smith, President of the Greater New York Academy of Prosthodontics, and Professor Frank E. Beube, Director of the Board of Periodontology.

Dr. William Greenfield became a Diplomate of the American Board of Oral Surgery and Professor Robert E. Herlands became a Diplomate of the American Board of Prosthodontics.

The activities of the Admissions Office were conducted under the direction of Professor Joseph A. Cuttita, Chairman of the Admissions Committee. The class of forty students which entered in September, 1960, was filled by May 9, 1960, and was selected from 230 applicants. This was approximately the same number of applicants as last year and the general quality of the applicants continued to be the same as in the past several years. The Committee feels that the small number of applications may very well be due to several factors, namely — high tuition fees,

lack of suitable dormitory facilities and Columbia's reputation for very high standards. There is an increasing number of inquiries on scholarships and scholarship aid available, and many of our applicants also ask to inspect our facilities and to visit our "dormitory" to help them decide which school they should attend. The presence of two new schools and the complete rebuilding of a third in the metropolitan area has had an influence upon admissions.

For postgraduate admission the usual large number of applications was received for the certificate course in orthodontics. These applications came from all over the country and from foreign countries as well. A class of twenty-two was selected from a total of 168 applications for this course in orthodontics. The postgraduate teaching program in other areas continued to be limited by the problem of inadequate space and facilities.

The clinics of the Department of Dental and Oral Surgery operated at about the same level as in the past few years. The number of patients given treatment was 6,923, and 3,575 of them were referred from Vanderbilt Clinic and Presbyterian Hospital. There were 56,274 patient visits made to the clinics; 25,506 were by Hospital patients and 30,768 were Dental School patients. Nine hundred and forty-seven patient visits were made to the Hospital Dental Service Clinic.

Professor Stoll directed the courses for dental hygienists. Thirty-two students were registered for the Bachelor of Science degree in dental hygiene, matriculants coming from eleven states. Six students were graduate dental hygienists of certificate courses in other dental hygiene schools, and two students resigned during the first semester.

The revised curriculum providing the minor area of study in public health has been tested and adjusted during the year. No curriculum changes were suggested for the year 1960-61.

Three clinics were in operation during the year. The dental hygiene clinic in the School of Dental and Oral Surgery operated three half-days during the autumn session, three full days during the spring session. A total of 909 patients were treated; a total of 997 patient visits were recorded. The clinic was supervised by Dr. Agate

Suurkivi during the first semester and by Professor McLean during the second semester. Two extramural clinics were operated in parochial schools; St. Rose of Lima and St. Catherine of Genoa. A total of 1,181 children were registered in the two schools and a dental prophylaxis was given to 266 of them.

During the five years in which the dental health program has been conducted in these demonstration schools, there has been a consistent improvement in the dental health of the children. By the end of the 1960 school year, sixty-nine per cent of the children in St. Rose had received adequate dental care; sixty-four per cent of the children in St. Catherine had received dental treatment. These figures are much better than the national average even though the schools are located in comparatively low-income areas of the city.

Much effort is being expended to maintain and improve the enrollment in the Courses for Dental Hygienists. Through the generosity of the Dental Hygienists Alumnae Association of the University, an appropriation was provided for the production and mailing of 1,000 new posters entitled, "B.S., R.D.H. for the Girl Who Wants Both." It was mailed to colleges and high schools with the current Bulletin of Information and a Brochure, "The Dental Hygienist. A Professional Career for Women." Favorable reaction in the nature of inquiries resulted. A total of 2,635 pieces of material was mailed during the year. A number of applications can be traced to this method of recruitment.

During the year, ten colleges were visited and guidance conferences attended. Seven colleges placed statements of transfer of credit to Courses for Dental Hygienists, Columbia University, in their present catalogues. Several contain pre-dental hygiene curriculums designed for transfer of credit.

Staff and students participated in three research projects continued from last year: a study to determine the efficiency of an electric toothbrush, a color scale for identifying degrees of gingivitis and saliva sampling from patients known to be heavy calculus cases.

In the Oral Surgery Division directed by Professor Friedrich the assignment of the two senior Residents in Oral Surgery from the Bronx Vet-

erans Administration to the Oral Surgery Clinic, one day per week each, has been consummated. These Residents are appointed as temporary Clinical Assistants during their year as Senior Residents at the Bronx Veterans Administration Hospital. Their services will add to the Division's service and teaching manpower as well as provide them with valuable outpatient experience.

During this past summer, committees of the Division have revised the didactic program of the Division with a view to eliminating unnecessary overlapping of course material and making room for a new course of eleven hours of lecture on team management of oral, facial and speech defects. This course will be presented by representatives of all the specialties dealing with the treatment and rehabilitation of birth anomalies, neoplastic surgery, and traumatic episodes. It will present the student with the full scope of those problems which are not susceptible to management by one specialty alone and guide him in orienting dental care to its proper place in the committee form of total patient care.

During the summer of this year the Division made available to the students who had finished their third year two week assignments to the oral surgery clinic. This was done on a completely voluntary basis and was supported most enthusiastically by eighty per cent of the class and will be repeated in the succeeding summer sessions.

During the year the Division provided consultation in response to requests for supervising physicians on the wards of the Presbyterian Hospital for 311 new patients. 122 new patients from Presbyterian Hospital were given oral surgical care in the clinic. The clinic provided oral surgical consultation and care to 609 new patients on request from the clinics of Vanderbilt Clinic.

The Oral Surgery Clinic rendered consultation and oral surgical care to 729 new patients from the undergraduate clinical program of the dental school.

In the reorganization associated with the separation of the Dental School from the Faculty of Medicine, the Division of Clinical Oral Physiology was combined with and changed to a Section of the Division of Orthodontics which is under the direction of Professor Di Salvo. The operation of the Orthodontic Division was greatly benefited by the construction of a new central

appointment office on the ninth floor. In addition to improving clinic routine, this liberated space to accommodate the personnel of the Division of Clinical Oral Physiology which became a Section of the Division of Orthodontics on July 1, 1959. This latter merger will be of mutual benefit since the work of both units is closely related in many areas. Additional space has been allocated to the Division for the establishment of a laboratory for research in the field of clinical oral physiology and occlusion. Efforts are now in the direction of providing equipment for the laboratory.

By becoming a Section of the Division of Orthodontics, the Section of Clinical Oral Physiology was able to extend its research and teaching activities because of improved physical and secretarial facilities. The Section is under the supervision of Professor Laszlo Schwartz.

The following research projects are under way: an evaluation of the value of electromyography in dental research and practice by Professor Schwartz, Professor Charles M. Chayes and Dr. Finkelstein in cooperation with Dr. Eli S. Goldensohn, Assistant Professor of Neurology and Associate Attending Neurologist; intra-muscular infiltration of the masticatory muscles utilizing 'Hypospray' for the relief of temporomandibular joint pain by Professor Schwartz and Dr. Paul I. Addison in cooperation with Professor Kutscher and Dr. Ronald W. Lamont-Havers, Instructor in Medicine; and a study to evaluate the use of removable orthodontic appliances in the treatment of temporomandibular joint pain and dysfunction by Professor Harold P. Cobin, Dr. Finkelstein and Dr. Issacher Yavelow.

Research in the Orthodontic Division continued along many fronts. Professor Clifford L. Whitman added to the collection of cephalograms and facial photos of subjects with untreated normal occlusions. Dr. James C. Coyle and Professor Di Salvo are beginning a patient recall system which should prove very informative regarding treatment methods and objectives. Professor Henry I. Nahoum is expanding the longitudinal study of growth and development of the dentition in children. Dr. Robert J. Huettner is continuing his study of the histologic changes produced by orthodontic forces applied to the teeth of Rhesus monkeys. Dr. Sidney L. Horowitz is

continuing the analysis of data obtained in a study of twins and is initiating a study of sex differences in craniofacial skeletal patterns.

The orthodontic clinic provided 8,467 patient visits. Of these visits, 1,700 were made by patients of Vanderbilt Clinic. 478 consultations were afforded and the number of patients receiving active orthodontic treatment averaged 434 throughout the year, each patient making approximately one visit every three weeks. In addition, about 206 patients were seen on an observation basis at varying periods during the year.

The teaching and research activities of the Pedodontics Division were under the direction of Professor Rosenstein. Expansion of the teaching activities in the Division has continued at the undergraduate and postgraduate levels.

In the undergraduate teaching activity increased emphasis has been placed on measures for prevention of dental and oral disease and disorders. Among these measures was the adoption of routine topical application of eight per cent stannous fluoride. This represents a single treatment anti-caries procedure which has demonstrated its effectiveness in lowering incidence of dental caries. There was also increased emphasis on dental care for very young pre-school age children.

In the postgraduate teaching activity efforts were made to extend the scope of training in the area of dentistry for handicapped children. Full time operation of the new Cerebral Palsy Dental Clinic, dedicated in memory of Mr. Saul A. Shlakman, and special assignment of postgraduate pedodontics students to the Hospital Dentistry Clinic of the Dental School permitted broader training in this specialized area of dental service. Thus patient management and dental care procedures were taught for children with mental retardation, emotional disturbances, seizures, hemophilia and other congenital and metabolic disturbances, as well as for children with cerebral palsy and accompanying conditions, with the latter representing the largest single group admitted for dental care.

The need for this phase of dental service and training continues at a high level and further expansion of this facility is warranted.

The research studies undertaken in the Division are closely related to fundamental aspects of

pedodontic service — namely, prevention of dental disease, prevention of the common disorders of the soft tissues and of the developing occlusion, clinical aspects of dental development, and important factors in dental care for handicapped patients.

Professors Rosenstein and William A. Verlin and Dr. Arnold Rosenberg began a study on the relation of pyridoxine, as a dietary supplement, to caries incidence in school children. Professor Rosenstein has continued his study on rampant caries in young children with a particular reference to its relation to early feeding habits. Long range studies in conservation of children's teeth were continued with the current phase conducted by Professor Rosenstein and Dr. Philip Kutner. The purpose of these studies is to help lessen the incidence of premature loss of children's teeth, which is responsible for a large percentage of malocclusion.

Dr. Albert Green, with Professor Rosenstein and Professor Kutscher, initiated a study on the use of the automatic action toothbrush as a possible aid in reducing gingival inflammation in patients with cerebral palsy.

In collaboration with Dr. William A. Silverman, Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician, Professor Rosenstein has recorded dental observations in survivors of prematurity at two and three years of age. The findings indicate a significantly high incidence of dental malformation involving areas of enamel formed pre-natally.

Dr. Seymour Koster initiated a study of orthodontic treatment in cerebral palsy to evaluate the feasibility of such treatment in older children with neuromuscular disturbance involving the oral musculature. Dr. Koster and Professor Rosenstein began a study of the effect of neuromuscular deficiencies upon occlusion in cerebral palsy patients with head and neck involvements.

One hundred and sixty-four children from two to eleven years were admitted to the Children's Clinic; there were 1,250 visits for diagnosis and treatment. In addition to instruction in home care and preventive measures, there was a total of 1,945 procedures and treatments. This included 102 cases involving pulp management procedures necessary to save teeth which otherwise might have been condemned to premature loss.

In the Cerebral Palsy Dental Clinic 134 patients with cerebral palsy and other severe handicapping conditions were admitted for complete dental care. There were 900 visits and 973 completed treatments. The successful management of these patients, whereby ninety-seven per cent have been treated under normal conditions and only three per cent have required general anesthesia for their dental procedures, has confirmed the practicability of the principles upon which the training program was based.

Another organizational change was the combining of the Division of Operative Dentistry and the Division of Prosthodontia to become the Division of Restorative Dentistry under the direction of Professor Smith. Professor Cain assumed the supervision of Operative Dentistry, Professor Herlands is in charge of Clinical Partial Dentures, Professor John J. Lucca is responsible for Clinical Full Dentures and Professor Howard A. Arden conducts technic courses in Prosthodontia. This combining of the two divisions into one is expected to give closer coordination in restorative dentistry teaching and clinic activity with some duplication in teaching being eliminated and a saving in time resulting.

The following research projects are underway in the Division and Dr. Harry Shpuntoff, Professors Lucca and Herlands are making an electromyographic analysis of maxillo-mandibular relations. In conjunction with the Division of Stomatology, Professors Lucca and Herlands are studying various protectant vehicles and drugs in the treatment of denture stomatitis. With Professor Kutscher, a study is being made of pulp protectants used in conjunction with clinical crown and bridge procedures. Student participation in these and other research activities is a major innovation in the research activities of the Division.

Professor Cohn is continuing his intensive research on condylar functional positions and is developing new instruments for accurately duplicating the temporomandibular joint radiographically. A study of the hinge axis and measurement of mandibular movements has been undertaken by Professor Arden.

Professor Herbert D. Ayers, Jr. has been continuing research on tooth structure and the physical properties of dental materials used in restora-

tive dentistry. He is also conducting a study on the physical properties of amalgam at the junction with previously packed fillings under a grant from the United States Public Health Service. Professor Ennio L. Uccellani has carried on a study of the use of muscle relaxants as an aid in obtaining centric registration.

Professors Cain and Portway are investigating the systemic absorption of mercury in humans after the insertion of amalgam fillings, and the efficacy of the jet spray for the administration of local anesthesia. Professors Harold Sherman and Joseph E. Fiasconaro are continuing their studies in the field of control of apprehension through analgesic drugs. Professor James W. Benfield is investigating the di-lok tray and the functional bite techniques for the construction of multiple inlays. Dr. Kenneth C. Deesen is continuing his research in close up intra-oral photography and has developed a technique for photographing the peripheral border of soft tissue lesions at 100 times magnification. Professor Joseph M. Leavitt and Dr. Marvin Firdman are investigating the effect of medicaments on the apical tissues of the Rhesus monkey.

Professors Leavitt and Irving J. Naidorf are studying the various sterilizing technics and agents for endodontic instruments. They are also investigating the effectiveness of various chemical sterilizing agents on selected organisms.

The Section of Operative Dentistry has treated 5,606 patients during the past year in the dental clinic.

The Operative Dentistry Service of the Presbyterian Hospital has cared for 2,230 patients under the supervision of Professors Cain and Portway.

The Prosthetic Section has had a large share of the patient care load at the School of Dental and Oral Surgery dental clinic. During the year, 5,859 patients were treated under this section. Of these, 51 per cent were straight dental patients, 47 per cent were referred through the Hospital, and 2 per cent were handled through the Dental Service for Presbyterian Hospital under the supervision of Prosthetic Consultants to the Hospital Dental Service.

A constant effort is being made in the care of clinic patients for the full utilization of modern technics and materials. Accordingly, students are

using higher engine speeds and more efficient diamond instruments. Some of the latest turbine engines have been introduced this past year in the care of patients.

The activities of the Division of Stomatology were continued under the direction of the Edwin S. Robinson Professor of Dentistry, Dr. Edward V. Zegarelli.

Under the sponsorship of the New York City Cancer Committee, Professor Zegarelli presented a twenty-hour course on cancer of the mouth before general dental practitioners. Approximately 600 dentists applied for the course which was given at the Columbia-Presbyterian Medical Center, but only 300 could be accepted. Professor Robin M. Rankow and Dr. Norah DuV. Tapley, Assistant Professor of Radiology and Associate Attending Radiologist, also participated in the course. The course will be repeated in early 1961 for the benefit of those who could not be accommodated previously.

A new publication called the *Journal of Clinical Stomatology Conferences* has been founded with its first issue appearing in October. The journal will be published quarterly and will be devoted to the publication of original case reports authored by students and faculty of our dental school. The first issue has received an enthusiastic response from numerous Deans throughout the country.

Professors Zegarelli and Kutscher in various papers reported on the beneficial, suppressant action of topically applied Vitamin A on various keratotic diseases of the mouth; on experiments in ameliorating the lesions of various acute and chronic diseases of the mouth through the topical action of triamcinalone acetate, a corticosteroid; an atlas of oral lesions in patients with the Peutz-Jeghers Syndrome; on the clinical and histological features of a rare, genetically influenced oral disease known as "familial white folded dysplasia; on a new oral adhesive which permits healing of oral lesions in considerable reduced time by protecting the healing phenomena from superimposed mouth irritations; on the use of triamcinalone acetate, a potent corticosteroid, applied topically to oral mucosal lesions, and on the use of the Pagano-Levin Culture Medium for culturing *Candida Albicans* organisms in establishing the diagnosis of oral moniliasis.

Dr. Solon Ellison, Assistant Professor of Microbiology, and Professor Mandel reported that they have demonstrated that parotid saliva, which until now was considered to be a serous secretion, contains considerable carbohydrate which they have identified and assayed quantitatively.

Dr. George Stein reported that he has demonstrated that pigmentation of teeth occurs after completion of the full thickness of enamel and that the pigment is passed from the ameloblasts through the cuticle and into the outer zone of enamel. Collaborating with Dr. Herta Spencer, he found that nutritional and vitamin deficiency changes in the human tongue is a slow and progressive process occurring gradually over several weeks. With replenishment, however, improvement occurs within several days. Dr. Hans H. Ncumann and Professor Di Salvo reported their conclusion that the low rate of dental caries among the Aymaras was due to greater chewing loads rather than the result of the chemical constituents in their diet.

Professors Zegarelli and Kutscher in collaboration with members of the Division of Stomatology including Professors Beube, Cuttita, Jack Budowsky, and Drs. Herbert F. Silvers, John D. Piro and Charles Berman, together with the active participation of dental students under the Student Research Fellowship Program of the National Institute of Health, are pursuing a number of investigations.

The usefulness of a new injection technique employing the principles of propulsion force and called the "Hypospray" is being investigated for parenteral and intraoral administration of drugs.

Continuing studies in regard to the etiology, nature and treatment of perplexing mouth diseases are progressing satisfactorily. The investigations include desquamative gingivitis, recurrent ulcerative stomatitis, periapical fibro-osteoma, idiopathic gingival fibromatosis and idiopathic bone "cyst."

The keratotic diseases of the mouth including hyperkeratosis, leukoplakia, lichen planus, etc., continue to occupy the interest of a group of investigators. The effectiveness of triamcinalone acetone (Kenalog) in controlling, ameliorating or suppressing certain inflammatory and ulcerative diseases of the mouth continues to be investigated. At present, topically applied corticoster-

oids appear to offer greater suppressant and more consistently beneficial actions than any heretofore known therapy.

The investigation of oral moniliasis is another important and continuing study. The incidence of candida albicans in mouths of normal patients, of denture wearers and hospitalized patients, and in patients with chronic oral mucosal disease including denture stomatitis is but a portion of this study. Evaluation of the Pagano-Levin Medium as a more practical laboratory aid for the isolation of candida albicans is a second part of this study. The effectiveness of Amphotericin B as oral fungicidal agent for the control of oral moniliasis comprises still another attack on this problem.

In collaboration with the Department of Pediatrics and particularly Dr. Carolyn Denning, Instructor in Pediatrics and Assistant Pediatrician, and Professor Dorothy H. Andersen, Professor of Pathology (to Pediatrics) and Assistant Attending Pediatrician, the oral manifestations of cystic fibrosis of the pancreas are being investigated. A severe pigmentation of teeth, a common finding among such patients, continues to be a challenging problem.

Although the relation of dental treatment to the onset of serum hepatitis is a problem of serious importance and although a protocol for investigating this problem in collaboration with Dr. Stuart W. Cosgriff, Assistant Professor of Clinical Medicine and Assistant Attending Physician, and Dr. John Scudder, Assistant Professor of Clinical Surgery and Associate Attending Surgeon, has been prepared and accepted, the lack of financial support continues to impede our efforts in initiating the study.

With the aid of Dr. Joseph E. Snyder, Director of the Vanderbilt Clinic and Administrative Assistant in Charge of Professional Services in Presbyterian Hospital, a study of the effectiveness of applying a minimal dosage of penicillin in the form of a pellet to the sublingual area as a screening technique for the detection of patients with severe penicillin allergy is being initiated. A supplementary study involves the efficacy of utilizing the sublingual route for the therapeutic absorption of analgesics, stimulants and sedatives. The effectiveness of tetracycline, topically applied to mouth tumors, as a diagnostic aid in

detecting oral cancer continues to offer some promise.

Professor Melvin L. Morris is continuing his investigations in periodontal tissue healing. These studies may shed considerable light on the factors which affect the deposition of cementum and the final positioning of the epithelial attachment.

The Curriculum Committee with the direction of its Chairman, Professor Di Salvo, has been making an extensive review of the undergraduate course in studies. Two objectives have been in mind. The first is to make recommendations on the establishment of a curriculum and schedule that the committee considers ideal and which should be the longer range objective. The other objective is to be a curriculum and schedule that is based upon the practicalities of our present organization, staff and space limitations but which is to be as close as possible to that to be recommended as ideal. Subcommittees were formed and many meetings were held. A number of recommendations were made in the nature of minor adjustments to schedules, number of hours, etc., but much is yet to be done before the objectives of the review will be realized.

In reporting for the last academic year, the problems facing the School of Dental and Oral Surgery were discussed in some detail and the comments made then still apply. Improvement

of the Hospital Dental Service is being given high priority. A suitable physical plant and improved financial support would relieve most of the problems facing the School. An early decision on the choice of site for a new dental building and approval of tentative plans are imperative before an attempt can be made to seek much needed financial support.

The dental staff wishes to acknowledge the generous contributions of many friends and organizations who have assisted us during the year. We are extremely grateful to the Johnson & Johnson Co., United Cerebral Palsy Research & Educational Foundation, Inc., United Cerebral Palsy of New York City, Inc., Merck Sharp & Dohme Research Laboratories, E. R. Squibb & Sons. The Kleinbaum Fund, Inc., Bristol-Meyers Company, the United States Public Health Service, the Dental Hygienists Alumnae Association of Columbia University, Columbia Committee for Community Service, Inc., Ciba Pharmaceutical Products, Inc., Squibb's Institute for Medical Research, Geigy Chemical Corporation, Astra Pharmaceutical Products, Inc., Edward L. Bernays Foundation, R. P. Sherer Corporation, the Revlon Corporation, Mr. Max Gordon, the Dental Hygienists Alumnae Association of Columbia University and to the many individuals who wish to remain anonymous.



Dermatology

CARL T. NELSON, *Professor and Chairman of the Department*
Director of Service

During 1960 outpatient visits to Dermatology in Vanderbilt Clinic numbered 29,747. There were 113 admissions to the Dermatology Ward and 846 in-patients were treated in consultation with other services. The mycology laboratory examined 3,978 specimens and the serological research laboratory performed 1,597 specific treponemal tests for patients seen by various services at the Medical Center. These data show that while there was little change in the number of patients treated by this service in 1960, the demand for the more complicated mycological and serological laboratory procedures continued to rise. This has over-burdened our physical facilities to such an extent that we are now encroaching upon laboratory space essential for our research needs.

There were no extensive changes in the training program for residents and fellows or in the undergraduate curriculum. Clinical instruction of medical students in Vanderbilt Clinic still suffers from the lack of suitable space.

Staff Changes

It is with sorrow that we record the death of Dr. Lewis B. Robinson, Consultant in Dermatology on April 24, 1960. Dr. Robinson was seventy-four years old at the time of his death and had served as a loyal member of the staff for forty-five years. An accomplished clinician, friendly and quiet, he will be missed by his colleagues and his many devoted patients.

Dr. Leo Schweich, Associate in Dermatology and Attending Dermatologist in Vanderbilt Clinic, and Dr. Paul Norris, Assistant Dermatologist, Vanderbilt Clinic, reached retirement age during the year. Dr. Schweich was appointed Lecturer in Dermatology and we are fortunate that we shall continue to benefit from the services of this enthusiastic and excellent teacher. Dr. Milton B. Sloane resigned as Instructor in Dermatology and Assistant Attending Dermatologist as of June 30, 1960.

Promotions effective July 1, 1960, include those of Drs. F. Philip Lowenfish and Meyer H. Slatkin to the rank of Assistant Clinical Professor; Dr. Charles F. Post to Associate; and Drs. Irving Abrahams, Marvin Brodey, James T. Hearin and Edward W. Jewell to Instructor. Professor Anthony N. Domonkos was promoted to Associate Attending Dermatologist, and Drs. Abrahams and Jewell became Assistant Attending Dermatologists in Vanderbilt Clinic.

New appointees to the staff during 1960 were Dr. John T. McCarthy, Instructor and Assistant Dermatologist in Presbyterian Hospital, Dr. Herschel C. Gore as Assistant in Dermatology, and Drs. Paul G. Meyer, Saul L. Sanders and Eugene Allen as Assistant Dermatologists in Vanderbilt Clinic. It is a particular pleasure to welcome Dr. McCarthy back to the staff on a geographic full-time basis. He was formerly Resident in Dermatology and returns after two years of military service. In addition to his clinical and teaching duties, Dr. McCarthy will assume active direction of the graduate training program for Residents and Fellows in this department.

Research Studies

The research activities of the Department of Dermatology during the year were supported by a number of organizations and individuals. Professor Leslie P. Barker and Dr. Paul Gross initiated a co-relative clinical and histopathologic study of the atrophic and sclerosing lesions of the vulva. Professor Helen O. Curth and Mr. I. Lester Firschein continued their studies on the relationship of acanthosis nigricans to visceral cancer. With Dr. Eli S. Goldensohn, Assistant Professor of Neurology and Associate Attending Neurologist, Professor Curth also extended the investigation of dermatologic conditions associated with disorders of the central nervous system. Dr. Bohdan E. Dobias made further observations on the effects of cellular extracts prepared from *C. albicans* on various transplantable tumors in

mice. Dr. Elizabeth L. Hazen continued her studies on the factors affecting sporulation in *M. audouini*. Dr. McCarthy, with Drs. Armando Silva, Jr., and Joseph Karlin, Visiting Fellows in Dermatology, investigated the antipruritic effects of xylocaine-containing topical preparations in various acute and chronic dermatoses. No evidence was found to suggest that such anesthetic medicaments were significantly more effective in these disorders than other types of local therapy used heretofore.

Professor J. Lowry Miller continued the investigation of the properties of the abnormal globulins found in the blood of patients with persistently biologic false positive reactions for syphilis. Professor Margarita Silva, in collaboration with Mrs. Irene Weitzman, made additional observations on the genetic and environmental factors affecting variation in the dermatophytes. With Miss Helen Buckley, Professor Silva also continued a study of the protein fractions of egg white which inhibit the growth of dermatophytes and systemic pathogenic fungi. Apparently the substances in egg white responsible for antifungal activity differ considerably in chemical make-up from those exerting antibacterial effects. Dr. Sanders, with Dr. Angel Trinchán-Plou and Dr. Silva, made further observations on the role of hypersensitivity in clinical dermatophytic infections due to *T. rubrum*.

Professor Gerhard K. Steigleder investigated the effects of soaps and detergents on the esterase activity of skin surfaces. As a result of these studies a new method was devised for measuring the degrees of protection afforded the surface of the skin by ointments and so-called barrier creams. Dr. Steigleder also initiated a study of the enzyme activity in keratinization. This work has yielded information which may be important in our understanding of psoriasis and other diseases characterized by abnormal keratinization. With Drs. John H. Menkes and Milton Alter, Fellows in Neurology, Professor Steigleder and Dr. David R. Weakley described a new sex-linked recessive disorder exhibiting retardation of growth, abnormal hair and progressive cerebral degeneration. Professor Steigleder and Dr. Weakley also investigated the behavior of mucopolysaccharides in the epidermis.

Dr. Weakley and Mrs. Julia M. Einbinder

studied the production of acantholysis and intra-epidermal vesiculation with weak solutions of cantharadine. The histologic changes observed closely resembled those seen in pemphigus vulgaris and it is possible that this method can be used as an experimental model to study the biochemistry and enzymology of this disease. The effects of cantharadine in mice are apparently blocked by the systemic administration of corticosteroids.

Staff Activities

During 1960, members of the staff again participated actively in the proceedings of various educational and scientific organizations in this country and abroad. Dr. George C. Andrews was elected President of the American Dermatological Association, and Professor Barker continued to serve as Secretary of the New York Dermatological Society. Dr. Arturo L. Carrion delivered the first annual Bailey K. Ashford Memorial Lecture at the School of Tropical Medicine, San Juan, Puerto Rico. Professor Curth addressed the Fourth National Cancer Conference in Minneapolis and Professor Domonkos again was Chairman of the Panel on Dermatologic Photography at the American Academy of Dermatology and Syphilology. Dr. Beatrice M. Kesten was elected President of the American Board of Dermatology and also served as Chairman of the Section on Dermatology and Syphilology of the New York Academy of Medicine. Dr. McCarthy addressed a Symposium on Pediatric Dermatology at the Philadelphia Skin and Cancer Hospital and Professor Miller continued as Secretary-Treasurer of the International Society of Tropical Dermatology. Dr. Royal M. Montgomery was elected President of the North American Clinical Dermatologic Society. Professor Nelson participated in the Second International Symposium on Sarcoidosis in Washington, D. C., and also served as a member of the Program Committee for the Twelfth International Congress of Dermatology. Professor Silva and Dr. Hazen addressed the Second Conference on Medical Mycology held at the New York Academy of Sciences. Professor Silva also delivered a series of lectures at the Inter-American University, San German, Puerto Rico. Professor Steigleder participated in the First International Congress of Histochemistry in Paris

and also served as consultant editor on the Pathology of the Skin for the Year Book of Cancer. He also addressed the Southwestern German Dermatological Society in Tübingen, Germany.

Visitors from other countries who were guests of the department during the year included Dr. Guy Ebrard, Hospital St. Louis, Paris; Dr. Hermano Neves, University of Lisbon; Dr. Wolfgang Raab, University of Vienna; and Dr. Yongyoot Sujjavanich, Chulalongkorn Hospital, Bangkok, Thailand.

Acknowledgments

The staff wishes to express appreciation to the following for the support given its research program during the year: Duke Laboratories, Inc.; Mr. and Mrs. Frank Greenwall; Lehn and Fink Products Corporation; Merek Sharp and Dohme Research Laboratories; Schering Corporation; Alfred P. Sloan Foundation; Winthrop Laboratories; and the estate of an anonymous donor. Various agencies of the National Institutes of Health also supported several research projects in this department.



Medicine

STANLEY E. BRADLEY, *Bard Professor and Chairman of the Department
Director of Service*

The sudden death of Professor Joseph Jailer on August 23, 1960, shocked and saddened the members of the Department and the Medical Service. Professor Jailer had been associated with the College of Physicians and Surgeons for more than twenty years, having been graduated with a Ph.D. in 1940, and an M.D. in 1943. Throughout this period he worked tirelessly in research and practice, combining in a most unusual and successful manner the ability to attract and train young people in medical science, the capacity to add new and important facts to our knowledge yearly, and the drive to maintain an active and satisfying private practice. The loss of such a talented and lovable man at the height of his powers is a hard blow.

The department lost three of its most valued members by retirement during the year. Professor Robert F. Loeb became Bard Professor Emeritus of Medicine following a year on sabbatical leave. He continues to serve as a Consultant and counsellor. Professor Franklin M. Hanger, with assumption of Emeritus status and appointment as Consultant, also leaves behind him an empty space that cannot be adequately filled. His wit, wisdom and wholehearted participation in the life of the department and service will be long remembered. Professor Alvin Barach became Professor Emeritus and Consultant after thirty-eight years of service. His work on respiratory physiology and pulmonary disease has won for him a worldwide reputation and many honors.

The Department of Medicine suffered two additional losses in the resignation of Professor Calvin H. Plimpton to embark upon a new career as President of Amherst College, and of Professor Helen M. Ranney to become Associate Professor of Medicine and head of the Heredity Unit at the Albert Einstein College of Medicine.

Honors

Many distinctions have come to various members of the service and department during the

past year. Professor Barach received an award from the American Association of Inhalation Therapists on November 27, 1960 at Minneapolis, Minnesota in recognition of his research activities, during the past four years, on the mechanism and treatment of respiratory difficulties. Professor Stanley E. Bradley was elected Chairman of the Advisory Council of the Life Insurance Medical Research Fund and first vice-president of the International Association of Nephrology. He gave the Morris Lecture at the Annual Meeting of the American Heart Association and the Alpha Omega Alpha Lecture at the University of Maryland School of Medicine, where he was awarded the annual distinguished honor award for the year 1960. Professor André Cournaud served as President of the Harvey Society, as Visiting Professor of Pharmacology at Baylor University, and as Chairman of the CIBA Foundation Conference on Pulmonary Circulation in London, England, which was organized in honor of Professor Liljestrand. In addition, he served as chairman of the Symposium on Neuro-respiratory Reanimation organized at the Hospital Claude-Bernard in Paris, France. His labors in behalf of the French Government were recognized in his appointment as a Commandeur des Palmes Academiques. Dr. Felix E. Demartini continued to serve as secretary-treasurer of the American Rheumatism Association. Professor Alfred P. Fishman continued as a member of the board of directors of the New York Heart Association and of the Editorial Board of Circulation Research. Professor Alfred Gellhorn was elected to the board of directors, American Association for Cancer Research and selected as one of five American Cancer Society Distinguished Lecturers in Biology.

Professor Michael J. Lepore was elected for the second year as secretary-treasurer of the New York Gastroenterological Association and as an Invited Alumni Guest to the first convocation of the University of Rochester in October, 1960.

Professor Loeb was named an Honorary Fellow of the Royal Society of Medicine in London, and was made a director of the Equitable Life Assurance Society and served as a representative of the Rockefeller Foundation at the Tercentenary of the Royal Society in London. Professor John H. McClement is president of the Eastern Section of the American Trudeau Society and president-elect of the New York Tuberculosis and Health Association, Inc. Professor Paul Marks received the Stevens Triennial Prize of Columbia University. Professor Karl Meyer received the Gairdner Award at Toronto, Canada for studies in connective tissue. Professor George Perera was appointed Assistant Dean of the College of Physicians and Surgeons. He participated in the Joint World Health Organization and Czechoslovakian Cardiology Symposium on Hypertension held in Prague in May. Professor Charles Ragan served as Visiting Physician-in-Chief at Robert Breck Brigham Hospital in Boston. He served as a member of the Executive Committee of the American Rheumatism Association, as chairman of its Publication Committee, and as chairman of the Cooperative Clinics Committee. In addition, he worked as a member of the Committee on Medical Research of the National Foundation, chaired the Medical and Scientific Committee of the Arthritis and Rheumatism Foundation and continued his association with the National Advisory Council, National Institute of Arthritis and Metabolic Diseases. Professor Dickinson W. Richards gave the John Phillips Memorial Lecture of the American College of Physicians at the annual meeting in San Francisco and the Sixth Bloomfield Memorial Lecture at Western Reserve University School of Medicine, Cleveland. Professor John Taggart was invited to address the International Congress of Internal Medicine at Basle and the Urologic Research Convention at Los Angeles. Professors Taggart, John H. Laragh and Bradley attended meetings and gave addresses at the First International Congress of Nephrology at Evian in France. Professor Sidney C. Werner was elected to honorary membership in the Medical Society of Finland, and is the only American member of that organization. He was a recipient of the R. Thornton Wilson award in Preventive and Genetic Psychiatry of the Eastern Psychiatric Asso-

ciation. Six members of the department were honored by election to the American Society for Clinical Investigation: Professors William A. Briscoe, James G. Hilton, Councilman Morgan, David Schachter, Henry O. Wheeler, and Dr. John Mithoefer. Professors Nicholas P. Christy and Wheeler, and Dr. Charles Christian continued to receive support as Markle Scholars in Medicine.

Teaching and Patient Care

During the past year the educational and service potentialities of the department have been enhanced by new departures in methodology and by new sources of support. The objectives and effectiveness of fourth year teaching in the Group Clinic have been by the subject of a careful study by the Executive Committee, consisting of Professors Dana W. Atchley, Frederick R. Bailey, Bradley, Gellhorn, Yale Kneeland, Jr., Perera, Richards, David Seegal, Taggart, and Joseph C. Turner, with the help of consultants from all the other services concerned. The Group Clinic has served as the model for similar "comprehensive medical care clinics" in many other teaching centers and has fully proved its value as a means of introducing students to the practical aspects of medical appraisal and management, and to a fuller concept of the patient in society. Dr. George Melcher has accepted the task of coordinating instruction by the various medical clinics in collaboration with the Chief of Clinics, Professor Alfred R. Lamb. Through the offices of Professor Atchley, the Clarence Dillon Fund has been established to support fourth year medical teaching.

Professor Marks has been placed in charge of the course on clinical pathology. He has undertaken a reorganization of the material usually offered, placing greater emphasis upon cell biology with a view to bridging the gap between the preclinical and clinical sciences. The opportunity for postgraduate training has been amplified by the award of two more training grants, in hematology under the direction of Professor Turner, and in gastroenterology under the direction of Professors Bradley and Charles A. Flood.

During 1960, 5,299 patients were admitted to the Medical Service. The length of stay in the hospital averaged 15.4 days, the daily census

averaged 226.5. More than 6,000 patients were admitted to the Group Clinic during the same period, 3,608 of whom were seen for the first time. The Group Clinic handled a total of 26,115 visits, the Medical Outpatient Department a total of 38,024. The remarkable array of disorders which provides our staff with balanced experience in the totality of disease is not reflected in these cold figures. The service was fortunate in receiving a grant from the Health Research Council of the City of New York to support three beds for two years on the Metabolism Service and to augment the nursing, dietician and technical staff for the purpose of promoting clinical investigation.

The educational program in social service under the direction of Professor Barbara Judkins is now in its third year. Support of this successful and important development has been provided by the Louise and Gustavus Pfeiffer Foundation and is assured until July, 1962. Means must be found for its continuance.

The department has been fortunate again this year in its Visiting Fellows and Trainees. More than fifty-five young men and women have worked with various units of the department during the past year in association with both full-time and part-time members. Nine came from other countries: Francisco Alvarado, Spain; Abraham J. Borkowski, Belgium; Jaime B. Coelho, Argentina; Lindsay A. G. Davidson, United Kingdom; Kenneth D. G. Edwards, Australia; Ruy V. Lourenso, Portugal; Mario Rigatto, Brazil; Paul Sfikakis, Greece; and Aryeh Szeinberg, Israel. Fellowship support was generously made available by the American Cancer Society, the American Trudeau Society, the Argentina National Board of Scientific and Technical Investigation, the Institute of Arthritis and Metabolic Diseases, Cyanamid National, Eli Lilly Foundation, Lederle International, National Institutes of Health, the New York Heart Association, W. K. Kellogg, and the United States Public Health Service.

Research Activities

The group of investigators associated with Professor Taggart are continuing their studies of various aspects of metabolism and active transport in the kidney. Earlier work by Dr. Thomas

E. Morgan had shown that the hippuric acids substituted on the benzene ring with one, two or three hydroxyl groups in various arrangements are accumulated by kidney slices *in vitro* at widely differing rates. Dr. Morgan, assisted by Mr. Donald Cohen of the second year class, has extended these observations to the dog by clearance techniques to show that excretion of the hydroxyl-hippurate involves movement of a substance out of the red cells during passage of blood through the kidney. A physicochemical interpretation of the data is now being worked out. Dr. Stephan Angielski is engaged in a study of the blocking effect of maleic acid in small doses upon urine acidification. Maleic acid is being examined for its effects on various renal enzymes and upon tissues elsewhere in the body. Dr. David Simpson has undertaken a series of studies on citrate metabolism in the kidney with special reference to the action of parathormone in altering certain renal transport of citrate.

Professors Bradley and Wheeler and the group associated with them, including Drs. Coelho, R. Curtis Morris, Jr., Rudolf Preisig, and Robert Whitlock, have continued their work on various aspects of renal physiology in patients with renal disease. A search is being made for methods by means of which alterations in function in nephron population may be produced and give rise to a corresponding alteration in urine flow and composition. The action of the upright position and abdominal compression upon simultaneously determined glucose and diodrast Tm is being determined. With Professor Laragh, a study of the effect of the blocking agent alpha-methyl DOPA amine upon renal function and renal circulatory adjustments is in progress.

Dr. Demartini is making a study of the various aspects of urate excretion in man and dog in collaboration with Drs. Louis A. Healey and Earl Wheaton. Special attention is being paid to the effects of pH potassium depletion and diuretics upon urate excretion. They have found that diabetic acidosis uniformly interferes with urate excretion to a marked degree, even when no change in filtration rate and blood flow occurs. Alkalosis appears to have no demonstrable effect. Long term studies of the action of chlorothiazide upon urate excretion have been carried out at Goldwater Memorial Hospital by this group, in

order to define the factors responsible for urate retention. Decrease in filtration rate, decreased blood flow appear to play a prominent role in this phenomenon.

Professor Perera remains interested in the clinical investigation of hypertensive disease. In collaboration with the Department of Public Health and Administrative Medicine, he has embarked upon a detailed survey of the acquired and inherited factors in primary (essential) hypertension. The number of family groups with hypertensive disease is now approaching statistical significance and studies of siblings and children lends weight to a genetic hypothesis. Professor Perera has obtained evidence of a rather sharp demarcation between normotension and hypertension, supporting those who find a clear bimodal population pattern.

During the past year, Professor Laragh has continued studies of electrolyte metabolism and of hormonal factors involved in hypertension and edema. He has been associated with Drs. Marielena Angers, Edmund Sonnenblick, and Paul Cannon in this work. Studies of the relationship of the sodium-retaining hormone, aldosterone, to arterial hypertension have been continued. In benign hypertension the aldosterone secretory rate appears to be normal, whereas a marked hyper-secretion has been observed in nearly all patients with malignant hypertension who have been studied. More recent investigations indicate that angiotensin stimulates aldosterone secretion, suggesting the possibility that the high aldosterone output of malignant hypertension may be the result of renal damage with renin release. These studies have been carried out in collaboration with Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology), and Dr. William G. Kelly, Research Associate in Obstetrics and Gynecology. Other studies of the action of aldosterone in the kidney indicate that the hormone acts largely upon the distal tubule to facilitate the formation of a dilute urine by promoting the selective reabsorption of sodium and chloride. A study of the effects of various drugs in edema and hypertension has been continued. A different type of aldosterone antagonist for use in the therapy of edema of congestive heart failure, cirrhosis and nephrosis is now under study in collaboration with Dr. Edith

Reilly of the Columbia Division of Goldwater Memorial Hospital. Alpha-methyldopa which appears uniquely to block noradrenalin production is under study. It has been found to be a potent, easily administered hypotensive drug. Development of this interesting compound is the result of earlier work in the department by the late Dr. Marcel Goldenberg.

Professor Abbie I. Knowlton has undertaken studies on adrenal regeneration hypertension. Skeletal muscles from rats made hypertensive in this manner do not show the alteration in electrolyte composition characteristic of muscles from rats with desoxycorticosterone hypertension, nor do the tissues show the dehydration which occurs in rats with cortisone hypertension.

Professor Barach, in collaboration with Dr. Eduardo Pons and Dr. Ruth Berg, has continued an investigation of electrocardiographic signs of coronary insufficiency induced by the Master two-step test. They have found that early use of oxygen, using a new type of portable oxygen apparatus, prevented signs of insufficiency in nine out of twelve patients. A clinical appraisal of inhalational therapy has been made, which indicates that the use of portable oxygen therapy extends the range of activity of patients with pulmonary emphysema and in addition makes possible an exercise program which contributes to their rehabilitation. Professor Hylan Bickerman and Dr. Gustav Beck have succeeded in improving the method of using saline aerosols at a temperature of 125° F., with more efficient mobilization of secretions from the lungs for diagnosis of neoplasm by Papanicolaou stain. Investigation of octofluorocyclobutane, C₄F₁₀, molecular weight 233, showed a marked decrease in maximal expiratory rate in patients with bronchospastic disease. A clinical appraisal of the use of this gas in combination with twenty per cent oxygen is being made in respect to its value as a mechanical expectorant, as well as in terms of respiratory function.

The Cardiorespiratory Laboratory, under the direction of Professor Fishman, included Professor Gerard M. Turino, Senior Fellow, New York Heart Association, and Drs. Edward H. Bergofsky, Roberta M. Goldring, Davidson, David E. Lehr, Rigatto, Robin W. Briehl, Martin A. Tuller, and Lournso. Dr. John A. Wood also par-

ticipated in the activities of the laboratory on a part-time basis. During the course of the year, a decompression chamber was completed in the laboratory for the assessment of the nature of the pulmonary capillary blood flow. It was shown that pulmonary capillary blood flow was probably non-pulsatile. In addition, it was found with the help of new rapidly responding gas analyzers that the rhythmic alterations in the concentration of various test gases in expired air were attributable to the impacts of the heart and great vessels. Methods are also being developed for measurement of regional blood flow within the lung using various inert gases as test substances. Two studies have been conducted in conjunction with the Department of Pediatrics which deal with the nature of the congestive state in Cooley's anemia and with the definition of the natural history of cystic fibrosis of the pancreas. In the former it has been shown that the diffuse hemosiderosis characteristic of the disorder is of little importance in affecting cardiovascular dynamics as compared to the anemia. In the latter, studies are being directed at the problem of the evolution of cor pulmonale and congestive heart failure in its course. Patients with rheumatic heart disease have been re-studied in this laboratory seven to ten years after mitral commissurotomy. It has been found that prompt relief of pulmonary hypertension following operation may be sustained for this full period.

Dr. Dorothy Estes, in collaboration with Professor Daniel L. Larson and Dr. Tor Richter, has completed a study of the long term effects of mitral commissurotomy in 130 patients. The results indicate that no more than forty-four per cent were definitely improved, and that peripheral emboli and congestive heart failure were leading causes of death in the thirty-one patients who died, that patients with severe congestive heart failure pre-operatively and with calcification of the mitral valve did poorly. A surprisingly high incidence of bacterial endocarditis was encountered in the immediate post-operative period.

The Edward Daniels Faulkner Arthritis Clinic group, under the direction of Professor Ragan, has continued a retrospective study of experience with rheumatoid arthritis. Prognostic indices and a better definition of the life history of the disease should emerge from these studies. Professor

Albert W. Grokocst is completing his monograph on juvenile rheumatoid arthritis in collaboration with Dr. Ralph Schlagger, Assistant Professor of Radiology and Assistant Attending Radiologist. Dr. Donald A. Gerber is working on the interaction of gold compounds with various serum proteins, studying particularly the binding of tyrosine. Dr. Charles Morris is continuing studies of the metabolism of the fibroblast. At the clinical level, cooperation with the Columbia Division of Goldwater Memorial Hospital and the New York Orthopaedic Hospital is continuing.

Professor Larson reports that in the cooperative study on the treatment of acute rheumatic fever involving the United States and the United Kingdom, data were analyzed on the five-year follow-up of 496 patients. It can now be concluded that in three treatment groups, using either salicylates, cortisone or adrenocorticotrophic hormone, there was no detectable difference in the outcome at the end of five years. He is collaborating with Drs. Arthur Snyder and Wheaton in making further studies of the natural history of lupus erythematosus in a special clinic newly organized for this purpose.

Three main areas of interest have dominated the work carried out in the laboratory of Professor Meyer during 1960; viz., aging, with special reference to the human aorta, the structure of heparitin sulfate, and Hurler's syndrome. It was found that the total concentration of mucopolysaccharides of human aorta does not decrease with increasing age as does that of other connective tissues. Of the four types of mucopolysaccharides, two (hyaluronic acid and chondroitin sulfates A and C), decrease, while two (chondroitin sulfate B and heparitin sulfate), increase. This work has been carried out in collaboration with Dr. David Kaplan. The structure of heparitin sulfate has been investigated by two approaches: chemical studies based mainly on methylation in collaboration with Dr. S. Hirano, and enzymatic degradation by adaptive microbial enzymes carried out jointly with Drs. Alfred Linker, Philip Hoffman and Miss Phyllis Sampson. The chemical studies have been unexpectedly difficult so that enzymatic degradation gave the first clues to the structure of heparitin sulfate. It seems to contain 1 → 4 uronic bond, is a highly branched molecule and contains in its

inner core disulfated disaccharide repeating units. In the course of studies on Hurler's syndrome, it was found that the liver stores chiefly heparatin sulfate, whereas in other tissues, the major polysaccharide appears to be chondroitin sulfate B. Previously these two polysaccharides had been found by this laboratory as major constituents in normal arterial tissue. Since arteries are seriously involved in these processes, the possibility that disturbances in heparatin sulfate may be concerned in other types of arterial disease is being investigated. Dr. Arthur Lindenbaum and Dr. Eugene J. Smith have been working as members of the laboratory during the past six months. Dr. Linker has resigned his position in the laboratory to take a position as Assistant Professor of Biochemistry at the University of Utah.

Over the past year, Dr. Christian has continued his studies of immune mechanisms in the rabbits hyperimmunized with bacterial antigens. The sera has been found to contain a factor which appears to resemble in every way so far investigated the human rheumatoid factor. This work, carried out in collaboration with Dr. John Abruzzo, suggests that a prolonged, sustained allergic stimulation might also be operative in rheumatoid arthritis. Furthermore, mechanisms of immune release of histamine and serotonin from rabbit blood platelets is under investigation. In addition to the immune reactants required for release of these chemical mediators, a serum factor appears to be necessary, which may be a component of serum complement. Attempts are being made to characterize this factor which can be obtained from normal non-immune sera. In collaboration with Dr. Gabriel Godman, Associate Professor of Microbiology, Dr. Christian is making a study of histological and histochemical changes occurring in the development of amyloid-like lesions in the kidneys of mice injected with soluble immune complexes.

Professor Larson has undertaken a series of immunological studies in collaboration with Professor Lepore, on serologic reactions on samples obtained from patients with a variety of chronic inflammatory diseases of the intestinal tract. In addition, he is attempting to produce an experimental disorder in animals resembling systemic lupus erythematosus using immunologic tech-

niques. Prolonged administration of nucleoprotein with Freund's adjuvant resulted in the appearance of non-specific extracellular material in the lymph nodes, but no splenic or renal lesions. Similar experiments using animals made hypertensive with DOCA and salt and then given hydralazine over a long period of time resulted in the production of an arteritis in the pulmonary vessels but no renal or splenic lesions. In collaboration with Dr. Healey it was observed that extracts of normal organs prepared with the non-ionic detergent, Tween 20, as an emulsifier, formed immune-like precipitates with human sera in an agar diffusion system. Further investigations employing a variety of methods, have shown that both Tween 20 and Tween 80 react with one or more serum proteins.

Professor William B. Sherman has continued work in collaboration with Dr. Elliott F. Middleton, Jr., on histamine release. Dr. Middleton has carried out experiments in using the blood of untreated allergic subjects (ragweed allergy), and has found that the rate of release is affected by antigen concentration, being most rapid at high antigen concentrations. In the subjects studied to date, histamine is released from cells to plasma at the rate of five to fifteen micrograms per liter of plasma per minute during the first three to five minutes, after which the rate decreases. No correlation exists between the total white blood cell count and the rate of release, suggesting that antibody concentration is the rate-limiting factor. New methods of measuring histamine have recently been introduced which appear to be more accurate and which employ smaller volumes of whole blood and plasma. Other experiments have been carried out on "slow-reacting-substance" (SRS), a material elaborated from guinea pig or human lung as a result of antigen-antibody reaction, which earlier work indicates is neither histamine or acetylcholine. SRS is capable of contracting human bronchial smooth muscle and may be a very important mediator in the production of bronchial asthma. This material appears to be an acidic lipid, and work is now in progress in collaboration with Dr. Gerald Phillips to define the chemistry and source of this substance. The possibility that it may arise from tissue phospholipids through activation of a phospholipase by the

antigen-antibody reaction is a possibility being investigated.

Professor Turner and Dr. Helen M. Anderson have continued their studies of the red cell membrane. Evidence has been obtained that a small part of the hemoglobin of the cell is firmly bound to stroma and travels with it electrophoretically. The complex appears to have a distinctive fatty-acid pattern as shown by gas chromatography. In the course of the work a new interaction of methemoglobin was encountered, the formation of a salt with deoxycholate. Studies are now being made to see if this phenomenon can be used as the basis for the measurement of small amounts of methemoglobin.

Professor Marks, in association with Drs. Szeinberg and Alvarado, and Miss Julia Banks, has continued genetic and chemical investigations of the hereditary deficiency of glucose-6-phosphate dehydrogenase (G6PD) in man. Studies of the properties of preparations of the enzyme purified from normal and affected subjects have provided evidence that at least three different mutations in man may lead to G6PD deficiency. The mechanism by which a deficiency in this dehydrogenase predisposes to hemolytic anemia has been further investigated. Certain normal body constituents, including ascorbic acid, cysteine and pyruvate, as well as drugs which cause hemolysis in subjects with a genetically determined deficiency of this enzyme, were found to increase the requirement for reduced triphosphoryridine nucleotide generation in red cells. The decreased capacity of G6PD deficient erythrocytes to form reduced triphosphopyridine nucleotide which is necessary to maintenance of the structural integrity of certain proteins, may permit changes such as irreversible denaturation of hemoglobin to occur in the red cells, predisposing these cells to destruction. With Dr. Ethel Tsutsui and Mr. Paul Reich of the fourth year class, Professor Marks has studied the effect of various steroids on the activity of G6PD. It was found that low concentrations of dehydroisoandrosterone, pregnenolone and certain related steroids are potent and specific inhibitors of mammalian G6PD. It is of interest that G6PD of organisms whose metabolism is not regulated by steroids, e.g., yeast, *Escherichia coli*, is not inhibited by these steroids. The steroid inhibition of G6PD may function as a

mechanism controlling the availability of reduced pyridine nucleotides for reductive syntheses.

Professor Stuart W. Cosgriff has continued his clinical evaluation of anticoagulant therapy for cerebral vascular insufficiency. These studies, carried out in conjunction with the Department of Neurology, indicate that anticoagulation may have a favorable influence, particularly in patients with disease of the basilar and internal carotid arteries. The experience to date suggests that the favorable prophylactic influence requires long-term administration of these agents without interruption even following relatively long asymptomatic periods. Patients who have experienced multiple coronary thromboses are being observed and treated on the ambulatory anticoagulant program in an effort to reduce the frequency of recurrent coronary thromboses and thus to improve prognosis.

Professor Schachter has continued experimental studies of the mechanisms which regulate the absorption of calcium and iron in the small intestine. Each of the minerals is absorbed by a relatively specific, active transport mechanism which can be demonstrated *in vitro* with segments of intestine. In collaboration with Dr. Daniel V. Kimberg, Professor Schachter has shown that the active transport of calcium is a facultative process that can be greatly enhanced when growing rats are deprived of dietary calcium. The active mechanism is demonstrable throughout the small intestine, and it is influenced by the pituitary, parathyroid, and adrenal glands. Vitamin D is required for the transfer process, and as a result of studies of the mode of action of the vitamin, a sensitive bioassay for its estimation was devised. The active transport mechanism for iron is under investigation also, in collaboration with Dr. James G. Manis. This process, too, appears to be facultative, in that a single dose of iron given orally depresses the iron transport *in vitro* for many hours thereafter. The effects of age, blood loss, pregnancy and inflammation are under investigation. In the course of these studies, a sensitive and simple fluorimetric method for the estimation of magnesium in serum and urine was developed.

Professor Wheeler has continued his investigations of the mechanisms of bile formation. These studies, carried out with the collaboration

of Dr. Preisig and Dr. Herbert Cooper, have yielded evidence that "basal" bile production in the unanesthetized dog is dependent upon, and proportional to, the rate of bile acid secretion. This result suggests that active anion secretion is the primary event in bile formation, and that the addition of water and other ions follows passively. The existence of an entirely separate bicarbonate secretion mechanism appears to have been demonstrated in the course of the response following administration of the hormone secretion. Studies of hepatic transfer of Bromsulfalein, in collaboration with Professor Bradley, Mrs. Edwin Baker, and Drs. Oswaldo Ramos and Preisig, have been carried further in the past year. Considerable data now supports the view that glutathione and BSP combine both *in vitro* and *in vivo* with the elimination of a halogen molecule and the formation of an S-C bond. Elemental analysis indicates that conjugation involves equimolecular amounts of the two substances.

Professor Flood has continued his study of esophageal motility in the Gastrointestinal Clinic during the past year. The various types of disturbed motor functions which occur in patients with hiatus hernia and other diseases are also under investigation. Interrelationships of pain mechanisms of esophageal and cardiac origin are under study with Drs. James Mather and Sidney Fink. A study of factors which affect prognosis in gastric carcinoma has been undertaken in collaboration with Dr. Josephine Wells, Associate Professor of Radiology and Attending Radiology and Dr. Harold D. Harvey, Professor Emeritus of Clinical Surgery and Consultant in Surgery. In the Ulcerative Colitis Clinic, a long-term study of the natural history of ulcerative colitis is being continued.

Professor Lcpore has found that serum protein electrophoresis has provided interesting data in some patients with ulcerative colitis. A serum albumin level of 2.5 gm. per cent or below seems to carry with it a very poor prognosis in this disease. He continues to carry out long-term steroid therapy in regional enteritis and to study patients with pancreatic insufficiency with special reference to their response to various pancreatic extracts.

Professor Christy has continued his studies of the metabolism of adrenocortical steroids in

various disease states. During the past year in association with Drs. William B. Drucker and Anastasia Sfikakis, evidence has been obtained for altered pathways of degradation of certain reduced steroid hormones in Gilbert's disease. Professor Christy has made further studies of the abnormal adrenocorticotrophic activity found in plasma of patients with Cushing's Syndrome associated with bilateral adrenal cortical hyperplasia. This activity disappears following X-irradiation of the pituitary, suggesting that an anterior pituitary hormone, perhaps adrenocorticotropin, may be of etiological importance in this disorder. Adrenocorticotrophic activity, presumably of another type, has been extensively studied in patients with acromegaly. Subjects with active disease show increased quantities of this abnormal substance in blood; those studied during inactive phases of the disease do not. The implication is that the abnormality is a consequence of increased concentrations of somatotropin in the blood, but this hypothesis remains to be tested further. A study of steroid entry in cerebrospinal fluid of dogs has been completed in association with Dr. Robert A. Fishman, Assistant Professor of Neurology and Assistant Attending Neurologist. A detailed appraisal of endocrine function in myotonic muscular dystrophy has been completed in collaboration with Dr. Drucker, Dr. William A. Blanc, Assistant Professor of Pathology and Assistant Attending Pathologist, and Dr. Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist. Pituitary, thyroid, adrenal, and ovarian activity appear to be normal in this disease, despite earlier reports to the contrary. Studies of the rates of secretion of various adrenal cortical steroids in patients with Cushing's syndrome and of the antagonism between the renal actions of progesterone and aldosterone during pregnancy have been studied with Professor Lieberman and Dr. Raymond VandeWiele, Assistant Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist. The mechanism underlying the hypokalemic alkalosis of Cushing's Syndrome has been investigated in association with Professor Laragh. Excessive secretion of cortisol rather than aldosterone can satisfactorily account for the electrolyte abnormalities observed.

Studies of pituitary and adrenal function and physiology in man and laboratory animals have continued during the past year in the laboratories of Professor Jailer, whose untimely death occurred on August 23rd. Dr. Donald A. Holub and Dr. Joseph J. Barlow were closely associated with Professor Jailer in the course of this work. In addition, the following Fellows have been important collaborators: Drs. Leonard V. Fisher, Dr. Andrew G. Frantz, Dr. Fred H. Katz, Dr. Marvin M. Lipman, Dr. Christopher Longcope, Dr. Jack H. Oppenheimer, and Dr. Joyce C. Shaver. Clinical studies with the adrenal hydroxylase inhibitor, SU4885, have been continued. Characteristic steroidal responses have been obtained in patients with Cushing's syndrome due to bilateral adrenal hyperplasia, Cushing's syndrome due to adrenal carcinoma, and patients with congenital adrenal hyperplasia. This compound has also been successfully employed in the treatment of sodium and water retention due to secondary hyperaldosteronism in patients with cirrhosis and ascites. SU4885 has also been used as a test of pituitary reserve in patients with pituitary disease or in individuals who have received prolonged therapy with adrenal steroids. Drs. Barlow and Holub are investigating the various routes of steroidal biosynthesis in the rat, using an *in vitro* technique employing various radioactive precursors. Evidence has been obtained for at least one alternative route of aldosterone biosynthesis in addition to that which is generally accepted. In addition, the effects of ACTH, reduced triphosphopyridine nucleotide and SU4885 have been investigated upon aldosterone and glucocorticoid synthesis. Human adrenal glands, obtained from patients with adrenal disease, and others with no endocrinological disorders, have been studied under similar conditions. Drs. Fisher and Oppenheimer have completed studies of pituitary function in patients with central nervous disease not involving the pituitary gland. Interesting functional discrepancies between the various trophic hormones, perhaps depending on the site of the lesion, have been discovered. In addition, the ability of Dilantin to decrease circulating levels of protein-bound iodine have been described and attributed to direct action upon thyroxin binding globulin. Dr. Longcope has continued studies upon the potentiation of various

pituitary trophic hormones by growth hormone. Dr. Shaver is studying the effects of protein deprivation in rodents upon body growth, pituitary function and hormonal content of pituitary glands. She is also initiating studies on pituitary function in patients with chronic malnutrition. Drs. Katz and Lipman have continued studies on 6-beta-hydroxy-cortisol, a recently described urinary steroid. This work, initiated by Dr. Frantz prior to his entry into the Navy, has shown that 6-beta-hydroxy-cortisol is a major unconjugated adrenal steroid present in urine and may represent a major route of excretion of hydrocortisone.

Professor Werner has continued his work along several lines of investigation into the mechanisms responsible for thyroid disease. Salt-retaining steroids were found to cause an exacerbation of the edematous manifestations of ophthalmopathy in some patients who have severe eye changes as a result of Grave's Disease, whereas diuretic agents, particularly spironolactone, caused subsidence. This appears to be attributable to retention of salt and water in, or loss from, the excessive mucopolysaccharide deposits in the affected areas. With prednisone, or diuretics and lesser doses of prednisone, striking improvement in the ophthalmopathy was observed, again in some patients but not in all. The effect was considered to be due to a decrease in both hyaluronic acid deposition and in local edema. Chromatographic studies of the serum iodine were continued in collaboration with Dr. Ila Radichevich and Mr. Vas Row, and with Dr. Richard Block and Mr. Richard Mandl of the Boyce Thompson Institute. A group of patients with non-toxic nodular goiters were identified who had "hyperthyroid levels" of iodothyronines in their serum, although I^{131} uptake, BMR, and PBI levels were normal. This previously unrecognized state of mild hyperthyroidism probably accounts for the frequency of cardiac arrhythmias in this form of thyroid disease. Similarly, another group of patients with non-toxic nodular goiter showed excesses of iodothyronines, but normal PBI levels, and hence were probably mildly hypothyroid. Finally, a euthyroid goitrous patient with excesses of an I^{131} -labeled substance having the mobility of triiodothyronine in several solvent systems was studied in considerable detail. The observation that stable iodotyrosines may exist in normal human serum

also has been under intensive investigation. Studies on the immunology of thyrotropic hormone have been extended. Following the identification of a single precipitin to the hormone, in collaboration with Professors Beatrice Seegal and Elliott Osserman, the antiserum to beef thyrotropic hormone was employed to study the nature of the "abnormal activator" recently discovered in the serum of Grave's disease patients. With Professors Seegal and Ephraim Otero-Ruiz and with Dr. Robert W. Bates of the National Institutes of Health, the biological effect on the thyroid of an active extract of hyperthyroid serum was successfully neutralized, as was the effect of thyrotropin present in normal human serum. The sera from four patients injected with a purified bovine thyrotropin preparation made by Dr. John Pierce of the University of California at Los Angeles, and made available by Dr. David Solomon of that institution, have been studied and were found to contain circulating antibodies to thyrotropin. This observation is consistent with the presence of refractoriness to hormonal effect following repeated injections that is so frequently observed in experimental animals. Work with Dr. Raul Grinberg on the mouse pituitary thyrotropic tumors has continued. A survey has been completed of the effect of a number of thyroxine analogues on each of three tumor strains, distinguished by the extent of responsiveness to thyroxine suppression. In addition, the strain capable of growing in mice with intact thyroids was found to induce hyperthyroidism in the host. This was accompanied by an unusually high diiodotyrosine: monoiodotyrosine ratio in the thyroid gland when ample iodine was fed in the diet. None of the animals developed exophthalmos.

Professor Donald F. Tapley has continued his studies on the peripheral metabolism of thyroxine and related compounds. It has been demonstrated that the difference in distribution of the L- and D-isomers of thyroxine to the peripheral tissues is of such magnitude as to suggest a possible basis for the explanation of the differing activities of the two isomers *in vivo*. In collaboration with Mr. Peter B. Dunne of the fourth year class, an investigation was undertaken which demonstrated that the distribution of the two isomers could be correlated with a difference in their ability to stimulate the oxygen consumption of the various

tissues *in vivo*. With Dr. Wendell B. Hatfield, the physiological disposition of the acetic and propionic acid analogues of thyroxine and triiodothyronine, and of the D-isomer of triiodothyronine in the rat was studied. The differences observed could also provide an explanation for the differences in apparent potency. Further, using L-(I¹³¹) monoiodotyrosine as a model amino acid for the study of the active transport of amino acids by the rat intestine, Professor Tapley has collaborated with Mr. Thomas F. Deuel of the fourth year class and Mr. Leonard Leventer of the first year class to investigate the behaviour of various C¹⁴-labeled amino acids. Evidence has been obtained for the formation of glucuronides in the active transport of monoiodotyrosine. The formation of an ethereal glucuronide has been established and presumptive evidence for the formation of N-glucuronides has been obtained. In collaboration with Dr. Ralph Herz, Jr., a Fellow of the National Foundation, and Mr. Roland G. Kallen, a fourth year student, an investigation was undertaken of the active transport of analogues of thyroxine by rat intestine. Although no evidence for the active transport of either thyroxine or triiodothyronine could be obtained, the propionic and acetic acid analogues of both compounds were found to be transferred from the mucosal to the serosal surfaces against a concentration gradient. All the transported material appeared to be in the form of a conjugate, which was in the form of an ethereal conjugate linked through the phenolic hydroxyl of the thyroxine analogues. The mucosal membrane is impermeable to the glucuronide so formed. This impermeability to the conjugate offers a reasonable basis for its accumulation on the serosal surface.

Professor Henry Aranow, Jr. has continued his study of the use of antithyroid drugs in the management of patients with thyrotoxicosis complicated by ophthalmopathy. Treatment has been governed by the view that the ophthalmopathic process is usually self-limited; that the pathogenic agent is absorbed on or inactivated by functioning thyroid tissue; that functioning thyroid tissue should be inhibited only to the extent demanded by the general health of the patient during the active phase of the ophthalmopathic process; and finally that patients should be gradually rendered euthyroid without significantly in-

creasing the risk of progression of the ophthalmopathy, when the condition of the eyes becomes stabilized. So far, 113 patients with thyrotoxicosis and ophthalmopathy so treated have been helped. The results suggest that this regimen offers a lesser risk of serious and permanent ocular damage than do others.

Professor Kermit L. Pines continues his investigations of the metabolic disturbances in patients with diabetes mellitus. During 1960, with Mr. Frederick Melges of the fourth year class, he investigated unesterified fatty acid levels under various conditions among diabetic patients. The data are too few to permit definitive conclusions, but it seems likely that they will yield information regarding the advisability of maintaining a normal blood sugar in those high-threshold diabetic patients whose urines remain free of sugar. Professor Pines and Dr. Hans W. Neuberg continue to collaborate on a study of the changes in vibratory sense in diabetic patients. Dr. Neuberg is, in addition, reviewing the charts of diabetic patients in order to attempt a retrospective study of the effect of dietary composition, particularly carbohydrate and fat distribution, on the incidence of vascular complications.

At Bellevue Hospital

Although no major changes in the research teaching or clinical work on the First Medical Division and Chest Service have occurred during 1960, certain evolutionary changes in the activities on the Services, and in the community at large, can be identified, which may have great importance for the future of Columbia at Bellevue. Steady progress has been made in the effort to bring about a closer integration between the two services in teaching and clinical activities. Most of the members of the fourth year class spend two months on the First Medical Division as clinical clerks. Throughout this period, increasing stress is placed upon responsibility and work organization in order to familiarize the students with the demands placed upon men entering upon internships following graduation. The teaching program on the Chest Service is concerned not only with second and fourth year students of the College of Physicians and Surgeons, but also with intern and resident physicians throughout all of Bellevue Hospital. Professor

Kneeland continues to direct the second year course in physical diagnosis, with reliance upon the facilities and patients of both services. Fourth year students are introduced to the study of pulmonary disease through work in the wards where they examine patients and participate in rounds and conferences. Interns are assigned to the Chest Service from the First, Second and Third Medical Divisions and resident physicians are appointed directly. During the current year, seventy-two interns and residents worked in the service. As the extensive building program moves forward to groundbreaking and ultimately to the replacement of outworn and outmoded facilities, it may be anticipated that the role of the First Medical Division and Chest Service in the teaching of Columbia students will be broadened and intensified.

A major change in the incidence of pulmonary tuberculosis in New York City has occurred during the past twenty-five years. Between 1952, the last year before the introduction of a major change in anti-tuberculous chemotherapy, and 1958, there was a mean decrease of nine per cent per year in the number of patients reported in the hospital with tuberculosis. Admissions to the Chest Service have tended to follow this trend, though by no means at the same rate. In 1950, 1,994 patients with tuberculosis were admitted to the Chest Service in comparison with 1,185 during the year 1960. The number of patients with non-tuberculous pulmonary disease has not changed appreciably since 1950. As a result of these changes, it seems very likely that the Chest Service will take care of an increasing proportion of the total number of persons with tuberculosis in New York City and that it will deal increasingly with a larger proportion of non-tuberculous pulmonary conditions. These readjustments should serve to bring into closer affiliation and operation the First Medical Division and the Chest Service, especially with respect to the organization of medical student teaching and house staff training.

Research

The Cardiopulmonary Laboratory, which continues to operate under the direction of Professor Cournand and Professor Réjane M. Harvey, with Drs. Luigi Donato, Jacques Durand, John O.

Parker, Melena Lewis, and Dudley Rochester, has been engaged in the development and improvement of a method of selective radiocardiography by means of which simultaneous measurements of the right and left ventricular output, end-diastolic and post-systolic volumes may be obtained. Pulmonary blood flow may also be measured in the course of steady or rapidly changing states of circulation. Professors R. M. Harvey and Harry W. Fritts, Jr. have embarked upon a study of the effect of changes in the pulmonary blood acidity upon pulmonary hypertension. In association with Professors Bradley and Wheeler, they are currently making a study of the effect of digitalis and nitroglycerine upon splanchnic vascular hemodynamics in relation to systemic hemodynamics in patients with congestive heart failure. Their work indicates that the response to these agents may involve a shift in blood from the splanchnic bed into the periphery, possibly as a result of changes in systemic venous capacity. Dr. Domingo M. Gomez has made a theoretical study of the oxygen-hemoglobin equilibrium and derived new equations by means of which the interaction between hemoglobin and oxygen may be expressed and predicted. He has collaborated with Dr. Ewald R. Weibel in making morphological observations on the geometry and dimensions of the pulmonary airways, vessels, and respiratory units in the normal lung. This work has led to the development of a model of the lung suitable for a bio-mathematical and physical analysis. Professor Fritts has attempted to study the oxygen requirements of lung tissue metabolism in various pathologic states. He has been able to develop a method based upon differences in output of the heart as measured by direct Fick and dye dilution techniques to measure the quantity of oxygen yielded to the lung tissue with each respiration. By this means he has been able to show that pulmonary tuberculosis and tissue consume a detectable quantity of oxygen. Professor Fritts has returned to full-time investigative and teaching activity in the department, following completion of a Fellowship in the Laboratory of Professor Ragnar Granit at the Karolinska Institutet in Stockholm where he made a study of the influence of afferent neural impulses upon the contracting force of the respiratory muscles of the cat.

Professor McClement has collaborated with Dr. Anne Davis upon the study of chemoprophylaxis in chronic pulmonary emphysema during the past two years. The members of the Chest Service under the leadership of Drs. David Simpson and Davis have set up an Emphysema Clinic for follow-up patients with this disorder. Professor Julia M. Jones and Dr. Robert R. Henderson have completed a study of the chemotherapy of pulmonary tuberculosis. More than 150 cases of tuberculous pleurisy with effusion have been followed for from one to six years after the completion of treatment. Demonstration of very few exacerbations and slight residual functional changes persisted after adequate treatment. Approximately 200 cases of tuberculous lymphadenitis have been followed for a similar period. Some relapses are being observed in this group, even after prolonged chemotherapy, but the results seem similar in those who have been treated with and without surgical extirpation. Professors McClement, Jones and Marvin Kuschner are studying the serial quantitative changes in the number of tubercle bacilli in the sputum and secretions of patients early in the course of treatment for tuberculosis. Preliminary observations have suggested that early in the course of treatment with chemotherapeutic agents there is a rapid drop in the number of organisms, which may provide an index that can be used in comparing various chemotherapeutic regimens. Dr. Simpson reviewed the pulmonary physiologic effects of tuberculosis. Studies of patients with respiratory insufficiency and tuberculosis are continuing. Drs. Anne Briscoe and William Loring continue to collect correlated information on the biochemical and pathologic characteristics of normal and emphysematous lungs. Alterations in the concentration of collagen, elastin, and other components of the emphysematous lung have been observed to vary from the normal in a fashion similar to that which has previously been observed with increases in age.

At Delafield Hospital

The activities of the Medical Service of the Francis Delafield Hospital include laboratory and clinical research as well as student, resident, and clinical fellow training. Emphasis is placed upon the clarification of various aspects of abnormal

growth. The investigators grouped under Medicine include members of the Department of Biochemistry who have joined together with members of the Department of Medicine to study problems of common interest. Laboratory and clinical researches have concentrated on the attack upon the physiologic and biochemical mechanism of disease. Combined studies of the disturbances in renal function in hypercalcemia, of the modification of respiratory physiology in metastatic disease of the lungs, and of the physico-chemical basis of paramyloidosis in multiple myeloma have yielded information of general value.

Professor Gellhorn has continued his studies of lipid chemistry and lipid metabolism in normal and tumor tissue in man. It has been established that the fatty acid composition of human subcutaneous adipose tissue is remarkably constant from one subject to the next, whereas the rate of fat synthesis by the adipose tissue varies greatly. In addition to observations on human adipose tissue, Professors Gellhorn and Marks are investigating lipid metabolism in normal human leucocytes and leukemic white blood corpuscles. Distinctive differences have been found between the leukemic and normal blood cells with regard to neutral lipid and phospholipid biosynthesis as well as the chemical constitution of the lipids. This area of research, little explored in the field of abnormal growth, may provide new light upon the known differences in energy metabolism of normal and neoplastic cells, and new information regarding the deviations in cell structure of the tumor cell from its normal counterpart.

Professor Osserman is coordinating clinical biochemical and immunochemical studies of plasma cell myelomas and macroglobulinemia. Since the institution of this program, 180 cases of plasma cell myeloma and twenty cases of primary macroglobulinemia have been studied and a large body of evidence has been obtained which relates several of the clinical and pathological manifestations in individual cases to the specific physico-chemical properties of the abnormal serum and urinary proteins which are elaborated in these diseases. As a result of these long-term studies, it is anticipated that the natural history of myeloma, and the results of therapy in this

disease, will be more precisely defined. Immuno-electrophoretic analysis has been found to be as specific a method for the detection of serum macroglobulins as ultracentrifugation, thereby establishing immunoelectrophoresis as a useful clinical procedure. The biology of the transplantable plasmocytoma of C₃H mice has been further investigated and progress has been made with the *in vitro* cultivation of this experimental tumor. This work, carried out in collaboration with Miss Dolores Lawlor and Mr. Charles Steinman, members of the second year class, has been combined with studies in which Mr. Alan Jay Dennis of the senior class has cooperated in developing techniques for the quantification of serum haptoglobin. With Mr. Peter Kohler of the senior class, the antibacterial properties of normal and pathological sera have been investigated. Preliminary results of this study have established the presence of a bacteriostatic and questionably bacteriocidal alpha-globulin, which is apparently distinct from the specific antibody, complement and so-called properdin systems.

Professor Henry Heinemann has carried out work in collaboration with Drs. Cemil Emirgil, Joel L. Zeffren, and Stephen Zsoldos. This group has investigated the effects of hypercalcemia on the renal concentrating mechanism in eleven patients with neoplastic disease and skeletal metastases (and in one patient with milk-alkali syndrome). The results indicate that hypercalcemia is associated with a reversible defect in the renal concentrating mechanism which is disproportionate to the simultaneous reduction in glomerular filtration. Studies of free fatty acid production by rabbit lung tissue *in vitro* (either perfused or minced) incubated with suitable substrates containing albumin and coconut oil emulsion, have shown that free fatty acid production is comparable to that of adipose tissue per gm. net weight. Perfusion of the whole lung appears to be associated with a continuous rise in free fatty acid content of the perfusate. The authors postulate that the lung may have functions other than facilitation of gas exchange, possibly playing a role in fat metabolism of the body. Preliminary observations in normal volunteers indicate that variations in tidal volume, without a change in alveolar ventilation, affect the diffusing capacity for carbon monoxide. Perhaps this is a

result of the concomitant change in physiological dead space.

Dr. George A. Hyman continues to be interested in the field of chemotherapy of neoplastic disease, continuing his studies of myleran in myeloid leukemia and the use of 5-Fluorouracil in advanced cancer. The Hematology Research Laboratory which he heads at the Francis Delafield Hospital has been making studies of patients with far-advanced cancer of the head and neck and with far-advanced retinoblastoma, using C^{14} -labeled triethylene melamine.

Dr. John E. Ultmann has worked closely with Dr. Philip Fiegelson, Assistant Professor of Biochemistry (Medicine), in studies of the enzymological microheterogeneity of normal and malignant tissues, and in studies of the properties of intracellular and liberated xanthine oxidase.

At Goldwater Memorial Hospital

The integrated program for patient care, research, and education at the Goldwater Memorial Hospital is now in its twenty-fifth year. The Departments of Hospitals and Health, the Federal Government and a number of private philanthropic agencies continue to give this section of the Department of Medicine strong support. The Health Research Council of the City of New York has provided funds for the development of a Metabolic Unit on the wards of the Service. This unit would permit more precise clinical investigations than previously possible. Professor Robert L. Hirsch has joined the group as an experimental pathologist. This unit will make it possible to intensify the program of clinical investigation and to extend the participation by the fourth year medical students assigned to the service in the study of pathological processes in patients with chronic diseases.

Professor Forrest E. Kendall, Liese L. Abell, and Erwin H. Mosbach are studying the effect of androgens upon cholesterol metabolism in dogs, rabbits, and rats. They report that in the dog on either high or low cholesterol diets, the oral administration of a synthetic androgen, 17-alpha-methyltestosterone, produces a profound reduction in the serum cholesterol levels. The cholesterol content of the alpha- and beta-lipoprotein fractions of the serum decreased in each experiment. This hypocholesteremic effect was also

demonstrated in albino rats fed a low cholesterol diet and in rabbits fed a high cholesterol diet. Professor Mosbach and Dr. Margaret Bevans are continuing their investigations of the dihydrocholesterol-induced cholelithiasis in the rabbit. Lesions of the biliary tract consisting of edema, cellular infiltration and concrements appear as early as seven days after institution of dihydrocholesterol feeding. The inflammatory reaction of the biliary tract precedes the appearance of gallstones which consist largely of glycine conjugates of cholic acids derived equally from cholesterol and dihydrocholesterol. The simultaneous oral administration of methyltestosterone inhibits the formation of gallstones and reduces the intensity of the inflammatory reaction.

Professor Daniel Rudman with Dr. Mario DiGirolamo is continuing his studies on a lipid-mobilizing substance in the pituitary gland. The active material has been separated from the nine other pituitary hormones and has been found to have the properties of a protein. Injection of this pituitary substance into the rabbit causes an immediate release of free fatty acids from adipose tissue into the blood. Mobilized fatty acids appear to be temporarily stored in the liver, where they are re-esterified, and then discharged into the blood in the form of triglyceride-rich chylomicra with resulting hyperlipemia. The biologic effects of acute and chronic injection of this pituitary substance in several different animal species, and its possible role in the normal and abnormal regulation of lipid metabolism are the subjects of current investigation.

Professor Alfred Steiner, Dr. Suat Akgun and Dr. Elliott Howard have extended their studies on the effect of antibiotics on the serum lipids. Oral neomycin produced a sustained decrease in the serum cholesterol concentration in all of thirty patients for periods of up to six months. Oral kanamycin and aureomycin also had the same effect, but the effect is not as consistent or as great. Professor Steiner and Dr. Howard report that the addition of three gms. of cholesterol dissolved in olive oil to a formula diet of patients results in an increase on the average of 80 mg% in thirty days.

Professor Arthur R. Wertheim, Drs. Seraphine Bern and Juan G. Edreira are studying the response of healthy "normal" subjects and patients

with documented coronary atherosclerosis to an oral fat challenge. Patients with coronary artery disease seem to have higher lipid levels after this challenge than do younger apparently healthy individuals.

Drs. Henry Lax and Arthur W. Feinberg have continued their long-term investigation of the arterial pulse wave. They have found that abnormalities of pulse wave occur in sixty-two per cent of 162 diabetic children, eleven to twenty years of age, none of whom displayed clinical evidence of vascular disease. Only eight per cent of 275 non-diabetic subjects of the same age had abnormal pulse waves. Although non-diabetic themselves, thirty per cent of forty individuals between the ages of eleven to thirty, with a positive family history of diabetes mellitus, had abnormal arterial pulse waves. These studies are now being extended to a group of 200 apparently healthy children below ten years of age as a part of a continuing investigation of the significance of the pulse wave changes.

Professor Arthur J. Patek, with Drs. Bevans, Arthur Sakamoto, Donald Oken and Mrs. Nancy deFritsch, has concluded a study of the recovery phase of dietary cirrhosis of the liver in the rat. Reabsorption and disappearance of connective tissue in the liver have been demonstrated by microscopic study and by chemical determination of collagen content. These changes together with the disappearance of inflammation, indicate that fairly complete recovery can take place in experimental dietary cirrhosis.

Dr. Henry Colcher with Mr. George M. Katz, Research Associate in Surgery, has developed a new method for taking color motion pictures through the gastroscope. Two types of instrument have been constructed, one with an external source of light using a fiberglass bundle to bring the light into the stomach; the other with intragastric intermittent illumination which is synchronized with the motion picture camera in order to avoid excessive heat production. The development of induced atrophic gastritis in the dog is being studied in collaboration with Dr.

David Kaufman by repeated gastroscopy and color filming.

Professor Bickerman, with Drs. Beck and Pons is applying the heated aerosol technique to obtain sputum specimens from patients with abnormal chest films suggestive of malignancy or tuberculosis. With Miss Sylvia E. Itkin, the assessment of non-narcotic antitussive agents is being continued with experimentally induced cough in healthy subjects by means of citric acid aerosols. Professor Bickerman is studying the properties of sputa in patients with chronic non-tuberculous pulmonary disease and their alteration by therapeutic agents. A method for determining the viscosity of these heterogeneous fluid specimens is being investigated.

Acknowledgment

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Microbiology

HARRY M. ROSE, *Borne Professor and Chairman of the Department*
Attending Microbiologist and Associate Attending Physician

It is a pleasure to report that Dr. Paul S. Russell was appointed Associate Professor of Surgery, assigned to the Department of Microbiology, effective July 1, 1960. Dr. Russell is well known for his work on immunologic tolerance and homotransplantation, and his accession to the faculty will strengthen teaching and research in this important area. Dr. Herbert J. Spencer, Mary Imogene Bassett Hospital, and Dr. Pandurang V. Divakar, received appointments as Associates in Microbiology. Dr. Emmett W. Bassett, Dr. Konrad C. Hsu, and Dr. Gerald Schiffman were each promoted to Assistant Professor, and Dr. William Cohen was promoted to Associate.

During the year three graduate students were in residence as candidates for the Ph.D. degree. In addition, the following persons held postdoctoral fellowships from the indicated agencies: Dr. Eiichi Furusawa, the Leukemia Society; Dr. Berge Hampar, Dr. Michael Mage, and Dr. Arthur J. L. Strauss, the United States Public Health Service; Dr. Donald M. Marcus, the Helen Hay Whitney Foundation; Dr. Jaroslav Hulka, the Josiah Macy, Jr. Foundation; Dr. Richard A. Rifkind and Dr. Stuart F. Schlossman, the National Foundation; and Dr. GianCarlo Nava, the Damon Runyon Memorial Fund.

The department was the recipient of two training grants from the United States Public Health Service, which by 1962 will provide support each year for six predoctoral and four postdoctoral students. This important assistance to the teaching program will allow the admission of qualified applicants who formerly could not be accepted for financial reasons.

The department was honored to receive several distinguished foreign visitors, including Professor L. A. Zilber, Gamaleian Institute of Epidemiology and Microbiology, Academy of Medical Sciences of the U.S.S.R.; Sir Howard Florey, Professor of Pathology, University of Oxford; Dr. Osamu Kitamoto, Professor of Medicine, Institute for Infectious Diseases, University of Tokyo;

and Dr. Hermann Michel, Professor of Bacteriology, Free University of Berlin.

Professor Harry M. Rose gave the eleventh Augustus B. Wadsworth Lecture at the annual meeting of the New York State Association of Public Health Laboratories; he also participated in the International Conference on Asian Influenza, at the National Institutes of Health. Professor Rose was appointed Consultant to the French Ministry of Education for the National Examination in Medicine. Professor Claus W. Jungeblut took leave for six months, under a Fulbright Fellowship, in order to serve in Cairo as Consultant to the Egyptian Ministry of Health. Professor Councilman Morgan received the Joseph Mather Smith Prize for 1960. Professor Morgan also spoke by invitation at the annual meetings of the American Academy of Dermatology and Syphilology, and of the Colorado State Medical Society.

Professor Rose, in collaboration with Professor Alice W. Knox, continued studies of the epidemiology and prevention of acute viral infections of the respiratory tract among military recruits at Fort Dix, New Jersey. An experimental polyvalent vaccine, containing both influenzal and adenoviral antigens, was shown to have a significant protective effect during a recurrent outbreak of Asian type influenza in January, 1960, and also during a later outbreak of respiratory infection in February and March caused by type 7 adenovirus. A new technique was developed for demonstrating rises in titer of specific antibody to adenoviruses in human sera, using the principle of hemagglutination-inhibition.

An account of Professor Elvin A. Kabat's work, which is carried out in laboratories at the Neurological Institute, under the Departments of Microbiology and Neurology, will be found in the report of the latter department.

Professor Beatrice C. Seegal and Professor Hsu continued their studies on the mechanism of experimental glomerulonephritis. The severity of

acute nephritis was found to be related to the quantity of nephrotoxic serum demonstrated in the glomeruli; it was also observed that when the initial nephritis was more acute, progression of the chronic disease was accelerated. In cooperation with the Department of Medicine, University of Rome, electron microscopic and immunofluorescence studies of renal biopsy material from patients with glomerulonephritis were extended. Similar investigations on the kidneys of patients with toxemia of pregnancy were conducted with Dr. Albert Altchek, Department of Obstetrics and Gynecology, Mount Sinai Hospital. Professor Seegal, in association with Dr. Sidney C. Werner, Associate Professor of Clinical Medicine and Associate Attending Physician, and Dr. Elliott F. Osserman, Assistant Professor of Medicine and Assistant Physician, reported on the immunologic and biologic characterization of Beef thyrotropin, using fluorescent antisera to detect the location of thyrotropin in tissues. Dr. John B. Zabriskie, Fellow of the Rockefeller Institute, continued his association with Professor Seegal's laboratory to pursue fluorescent antibody studies of surgically removed cardiac auricular appendages. Dr. Zabriskie demonstrated human gamma globulin and, in some instances, undetermined products of Group A streptococci in myocardial areas which, on histologic examination, showed old or recent lesions of rheumatic fever. Dr. Arthur J. L. Strauss employed the fluorescent antibody technique to examine sera from patients with myasthenia gravis and other disorders of muscle. It was found that a skeletal muscle-binding, complement-fixing component exists in the crude globulin fraction of pooled and individual sera of patients who are suffering from myasthenia gravis of recent onset and progressive character. Recent experiments indicate that the myosin-containing A band is the area involved in this reaction. Experiments were conducted by Dr. Strauss, in association with Dr. Arline D. Deitch and Dr. Philip W. Brandt, Instructor in Anatomy, to delineate this reaction more precisely. Mr. Stanley Cohen, a fourth-year medical student, investigated the uptake of serum proteins in normal and neoplastic rat liver. A significant difference in the intracellular localization of these substances was observed in the two types of tissue. In collaboration with Dr. Werner

R. Loewenstein, Associate Professor of Physiology, and Dr. Seymour Ehrenpreis, Assistant Professor of Neurology, Mr. Cohen began a study of the distribution of receptor material in nerve tissue, using the fluorescent antibody technique.

Professor Calderon Howe continued his studies on the enzymatic activity of influenza virus. The enzyme neuraminidase was isolated and shown to be antigenic in rabbits, thus making available another immunochemical basis for further comparative study of these agents. The substrate used for most of this work was a sialic acid-containing polysaccharide obtained from the salivary mucin of a species of oriental swiftlet. This material was purified and characterized. Study of enteroviruses in cell culture, by histochemical techniques and electron microscopy, was continued in collaboration with Professor Gabriel C. Godman and Dr. Rifkind.

Professor Morgan studied the development of Western equine encephalomyelitis virus in infected cell cultures by means of the electron microscope. The virus appeared to develop in the cytoplasm and to leave the cell by a unique process of ejection. In collaboration with Dr. Rifkind and Professor Godman, stages in the development of an enterovirus, ECHO 9, were examined both in the light and the electron microscopes. Within cells exhibiting shrinkage of the nucleus and vacuolization of the cytoplasm, remarkable linear crystals of virus were encountered. The manner of formation and subsequent release of the virus was taken under investigation. Together with Professors Hsu, Knox, Seegal, Dr. Rifkind, and Dr. Margaret Holden, antibody globulin was conjugated with ferritin. The iron in the latter compound is clearly visible in the electron microscope and thus permits recognition of the site of antigen-antibody interaction. Type-specific antibody was seen bound to the surface of influenza virus. This work was pursued with the expectation that specific immunologic identification of viral particles in the electron microscope would at last become possible.

Professor Godman conducted cytochemical and microscopic studies of viral development, in collaboration with Professors Howe, Morgan, Rose and Dr. Rifkind. The results of a correlated electron microscopic and histochemical study of type 5 adenovirus were published. Quan-

titative cytochemical determinations of nucleoprotein in infected cell nuclei were begun. Striking nuclear and cytoplasmic alterations were found in cultured monkey kidney cells within twenty hours after inoculation of ECHO 9 virus, in relation to the intracellular synthesis of virus. These observations are being extended by cytochemical methods. It was found that other enteroviruses, e.g., ECHO 11 and poliovirus type 1, caused similar cellular changes. The previously reported determinations of quantitative changes in the nuclear nucleoproteins which accompany maturation of cells of the lymphocytic series were extended by Dr. Deitch to a study of cells of the plasmacytic series antibody formation. Quantitative studies with Dr. Charles C. Morris on the biosynthesis of acid mucopolysaccharides in cell cultures of osteogenic fibroblasts under various culture conditions were completed and the results embodied in two publications. Current work is concerned with the synthesis of the more specialized sulfomucopolysaccharides *in vitro*. In this connection, the behavior of fibroblasts derived from a patient with Hurler's disease is being scrutinized with respect to production of sulfated and nonsulfated mucopolysaccharide. Electron microscopic studies of matrix formation during chondrogenesis were prepared for publication.

Professor Sam M. Beiser continued an investigation of the biological, chemical, and immunochemical properties of steroid-protein conjugates, in collaboration with Dr. Frederick J. Agate, Associate Professor of Anatomy, Professor Bernard F. Erlanger, and Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology). Evidence was obtained that antibodies to testosterone and progesterone act as anti-hormones. An additional conjugate, aldosterone dog serum albumin, was prepared and shown to be antigenic in dogs and rabbits. Antibodies from these animals were also studied for antihormonal activity. The proposed unity in the specificity of enzyme and antibody induction by the same determinant group was extended to β -D-glucosides. These studies, in collaboration with Professor Stuart W. Tanenbaum, Professor Bassett, and Dr. Mage, were extended in an attempt to determine the structure of the specific combining regions of antibodies and enzymes. Dr. Nava collaborated in an investigation of bac-

terial transformations. In particular, the specificity of inhibition of transformation by non-transforming deoxyribonucleic acid and the effects of various physical and chemical agents on the transforming principle were examined. In addition, a study of the transforming reaction in *Bacillus subtilis*, as well as in *Diplococcus pneumoniae*, was undertaken. Dr. Hulka began an investigation of immune phenomena in pregnancy. Professor Beiser participated in seminars at the University of Pennsylvania, Brandeis University, Albert Einstein College of Medicine, and the New York State Department of Health, as well as in a symposium before the Eastern Analytical Section of the American Chemical Society.

Professor Tanenbaum continued his research program with Professor Beiser on the stereochemical and conformational relationship between enzymes and antibodies induced by the same determinant groups. As a part of this study, Mrs. Gertrude C. Burke delineated the specificity of the combining site of antibody to the β -D-galactosyl moiety; and Professor Bassett developed a rapid, high-yield method for the purification of antibodies to conjugated antigens. Dr. Mage participated in this work. Professors Bassett and Tanenbaum demonstrated the participation of acetyl-coenzyme A in the biosynthesis of extramycelial aromatic compounds produced by the *Penicillia*, and Dr. Paul E. Brenneisen studied the chemistry and biochemistry of tropolone derivatives formed by these microorganisms. Dr. Divekar began an investigation of the biosynthesis of the pyridine ring by a *Streptomyces* spp. Professor Tanenbaum participated in two symposiums on the biosynthesis of aromatic fungal products at meetings of the American Chemical Society, and addressed seminars at the Oak Ridge and Brookhaven National Laboratories on the subject of unity in the specificity of induction of antibodies and enzymes. Professors Tanenbaum, Beiser, and Solon A. Ellison jointly conducted a course in microbiology GS111, in the School of General Studies.

Professor Erlanger continued his studies of the interaction between various insoluble organic compounds and proteins. The use of biphenyl as a chromatographic medium for the purification of proteins was investigated. Experiments were carried out to determine the role of arginine in enzymatic mechanisms. Together with Dr. Cohen,

properties of the "active site" of chymotrypsin and trypsin were investigated through the reactivation of diethylphosphoryl enzymes by specific nucleophilic agents. In association with Professors Agate, Beiser, and Lieberman, and Dr. Paula Zimmering, Research Associate in Biochemistry, an investigation of the chemical, immunochemical and endocrinological properties of steroid-protein conjugates were extended.

Professor Ellison continued his studies of human saliva and salivary calculus. The carbohydrate components of parotid saliva were identified and assayed. A comparative study of the proteins and glycoproteins of parotid salivas from caries-free and caries-susceptible adults was begun. Further investigation of the chromatographic separation of salivary proteins was carried out. Several procedures for the purification of amylase were devised and are being compared with respect to purity and yield of enzyme. Several of these preparations, obtained chromatographically, were found to be as active as crystalline enzyme. This work was done in collaboration with Dr. Irwin D. Mandel, Associate Clinical Professor of Dentistry, and Dr. Hampar. Dr. Hampar began studies of salivary gland virus infection in the hamster. Investigation of the radiobiology of bacteriophages was continued in collaboration with Dr. Ruth F. Hill, Assistant Professor of Radiology (Physics), and Dr. Rose R. Feiner, College of the City of New York, particularly in connection with the growth of ultraviolet-irradiated T-phages in *Escherichia coli* B and in ultra-

violet-sensitive mutant strains derived from this bacterium.

Dr. Holden has continued an investigation of the effect of adrenocortical steroids on cells *in vitro*. Studies were completed concerning the action of hydrocortisone on the ability of fibroblasts to support the growth of vaccinia virus when compared with concurrent cytologic changes in hydrocortisone-treated and normal cells. The growth rates of both hydrocortisone-treated and normal fibroblasts in suspension cultures were studied by means of viable cell counts as well as by the measurement of packed cell volumes. Fluorescent antibody technique was used to determine the localization of herpes and vaccine virus in mouse brain tissues.

The laboratories of the diagnostic service performed 62,862 examinations, not including bacteriophage typing of 2200 strains of *Staphylococcus aureus*.

The department gratefully acknowledges support of its research activities from the American Cancer Society, American Otological Society, Bristol-Meyers Company, the Jane Coffin Childs Memorial Fund, General Ceramics Company, the Philip Hanson Hiss, Jr. Memorial Fund, the Leukemia Society, the Mary Murray Mahony Fund, the Population Council, the National Foundation, the National Institutes of Health, the National Science Foundation, the Office of Naval Research, the Office of The Surgeon General, Department of the Army, and Harry M. Stevens, Inc.



Neurological Surgery

J. LAWRENCE POOL, *Professor and Chairman of the Department
Director of Service*

The Service of Neurological Surgery has enjoyed an active year marked by improvements in the surgical treatment of such rare and dangerous lesions as arterio-venous sacs of the vein of Galen, craniopharyngiomas, Parkinson's Disease, and aneurysms of the anterior communicating artery.

Three cooperative inter-service groups meet regularly to study improved methods for the diagnosis and treatment of intracranial aneurysms, temporal lobe epilepsy, and primary malignant brain tumors.

The use of hypothermia and intravenous urea has been extended during and after surgery for the treatment of ruptured intracranial aneurysms and also for massive subfrontal tumors such as craniopharyngiomas, meningiomas, chordomas, and epidermoids. A greater use of the bifrontal craniotomy, developed by Professor J. Lawrence Pool, has also improved the removal of such tumors and the surgery of subfrontal aneurysms.

Research Activities

Continued efforts have been made toward the improvement of the surgical treatment of intracranial aneurysms by Professor Pool; a comprehensive review of the principles and treatment of hydrocephalus has been made by Professor John E. Scarff; and a continuing study of an improved radio-active scanning technique for the localization of brain tumors and for circulatory problems of the brain has been made by Professor Edward B. Schlesinger.

Professor Fritz Cramer has been actively investigating clinical neurosurgical problems such as visual defects caused by intracranial arteries, while Professor Lester A. Mount is studying the collateral circulation of the brain.

Professor Joseph Ransohoff has been actively participating in the study and treatment of temporal lobe epilepsy, perfusion techniques for the malignant brain tumor, and hydrocephalus by ventriculo-cardiac shunts.

In the laboratory, Dr. James W. Correll has completed part of his work showing the influence of the nervous system on fat metabolism. This project has included a systematic study of the effects of hypothalamic, spinal cord and peripheral nerve lesions, as well as nerve stimulation on serum lipid changes. Dr. Correll has also been interested in the syndrome of partial carotid artery occlusion in the neck.

Dr. Thomas J. Bridges has continued his work on hypophysectomy for the treatment of carcinoma of the breast and prostate.

During Professor James B. Campbell's extensive research on peripheral nerve and spinal cord regeneration, with Dr. C. Andrew L. Bassett, Assistant Professor of Orthopedic Surgery and Associate Attending Orthopedic Surgeon, valuable data on the collateral circulation of the spinal cord has been accumulated which promises useful clinical application. Professor Campbell is also perfecting a stereotaxic-radioactive method of treating Parkinson's Disease, with Dr. Harold H. Rossi, Professor of Radiology (Physics).

Other research activities include further neurophysiological and neuropharmacological definition of the synaptic organization of the developing cerebral cortex by Professor Dominick P. Purpura and his group, together with studies of the interaction between thalamic and other subcortical structures and the cerebral cortex. Dr. Edgar M. Housepian and Dr. Giovanni Marini have participated actively in this work which has led to an electrical mapping technique that has clinically proved of value.

Dr. John N. Potanos has been active in working out the site of incorporation of tagged carbon atoms (C^{14}) in brain tissue. His biochemical approach to the study of cerebral metabolism is expected ultimately to have a significant bearing on the growth of malignant brain tumors and hence, perhaps, in their cure.

Dr. Frank Boschenstein, Assistant Resident in Neurological Surgery, has been spending the year

in the development of an improved method of growing brain tumor cells under the direction of Dr. Samuel Graff, Professor of Biochemistry.

Parkinson's Disease continues to be a subject of particularly intensive study both in the laboratory and clinically by means of electrophysiological and electron microscope studies. Improved stereotaxic techniques have been developed to a point where clinical results have become exceedingly gratifying, thanks to the work of Dr. Housepian and the cooperation of Dr. Juan M. Taveras, Professor of Radiology and Attending Radiologist.

At the Bronx Veterans Administration Hospital, Professor Erich G. Krueger, Chief of the Neurosurgical Section, has published three interesting clinical papers, one dealing with hemorrhage into the pituitary adenoma.

The number of patients cared for during the past year is essentially the same as in previous years. The number of patients seen in the Neuro-

logical Surgery Clinic during the year is approximately 800, while a total of approximately 1,000 major operations were performed during the year. An unusually large number of observers from this country and other nations visited our operating rooms this year.

Most members of the Resident staff are also engaged in clinical and laboratory investigations.

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Neurology

H. HOUSTON MERRITT, *Professor and Chairman of the Department
Director of Service*

The year 1960 was marked by the completion of the first stage of the remodeling of the Neurological Institute. The new entrance and administrative offices add to the dignity of the Institute, and the new staff offices are a welcome addition. The twelfth floor has been converted into bright attractive quarters for patients with minor psychiatric disturbances which helps to broaden the services which the Medical Center can offer to its patient.

The teaching activities of the department remain at their previous high level. The elective course in clinical neurology continued to be popular with our students and also attracted a number of students from medical schools in various sections of the country. To aid in the instruction of the largest number of students who elected neurology in the summer trimester, Dr. William K. Jordan, formerly Professor of Neurology at the University of Arkansas and now Professor of Neurology at New York University, was appointed Visiting Professor for the months of June and July.

The laboratories of clinical electroencephalography at the Neurological Institute and in the Presbyterian Hospital under Professor Paul F. A. Hoefer have again carried a heavy patient load. Over 6,200 cases were tested. In addition, several hundred electromyographic examinations and a similar number of chronaxie tests were performed. Dr. Archibald R. Foley served on a United States Public Health Service Postdoctoral Fellowship as a full-time assistant in the department from July 1, 1959 to June 30, 1960. On July 1, 1960, Dr. Margaret R. Seiden, and on October 1, 1960, Dr. Robert deNapoli joined the department as full-time members on the staff. Dr. Danuta Daniec, a pediatrician from Poland, and Dr. Valentine Volpe, a psychiatrist from Rosario, Argentina, spent several months in the laboratory. Dr. Maria Ungo De Folle, from Montevideo, Uruguay, has started a one year training fellowship supported by the Organiza-

tion of American States on September 15, 1960.

Professor Hoefer with Dr. Henry Aranow, Jr., Assistant Professor of Medicine and Assistant Attending Physician, and Professor Lewis P. Rowland has continued his studies in myasthenia gravis. Dr. William L. Nastuk, Associate Professor of Physiology and Dr. Maxcy Smith, Research Associate in Physiology, are investigating possible immunological factors in the etiology of myasthenia gravis. In cooperation with Dr. Robert H. Wylie, Clinical Professor of Surgery and Attending Surgeon, the therapeutic effects of thymectomy and thymomectomy on the course of myasthenia gravis are still being studied. Mr. Leonard Zablow is studying the properties of metal electrodes for stimulation and recording in tissue fields. He is also cooperating with Professor Eli S. Goldensohn and Mr. Kalman Rabinowitz in the construction of test equipment for conditioning of alpha activity by sound and touch stimuli and for measuring of response time. Dr. Seiden has started an investigation of the long term effects of drugs currently used in the treatment of petit mal. She is trying to determine the incidence of grand mal, occurring in later years in those patients, comparing cases with adequate treatment of petit mal with others where no or ineffectual treatment is given. The first step is a retrospective study of cases of reliably diagnosed petit mal epilepsy with good follow-up.

Professor Hoefer has reviewed the pharmacological and clinical effects of ambenonium chloride and of pyridostigmine bromide at the request of the Council on Drugs of the American Medical Association for which he acts as a consultant. Professor Hoefer was elected to the Medical Board of the Myasthenia Gravis Foundation.

Professor Goldensohn, Dr. Joseph Ransohoff, Associate Professor of Clinical Neurological Surgery and Associate Attending Neurological Surgeon, and Dr. Shirley Ferguson, Research Associate in Psychiatry, in association with Dr. J. Lawrence Pool, Professor of Neurological Sur-

gery and Director of Service, Professor Melvin D. Yahr and Adam Munz are continuing their investigations on behavior and personality in patients treated by temporal lobectomy for intractable seizures of temporal lobe origin. Professor Goldensohn and Dr. Dominick P. Purpura, Associate Professor of Neurological Surgery, and Dr. Edgar M. Housepian, Instructor in Neurological Surgery and Assistant Neurological Surgeon, are engaged in electrophysiological and neuropharmacological studies of the organization of the human cortex at the time of neurosurgical procedures. They are also attempting to define the nature and origin of epileptic discharges recorded from the exposed cerebrum of patients with convulsive disorders. In these studies the use of topically applied amino acids has permitted some analysis of the origin of different components of spontaneous paroxysmal discharges. Professors Goldensohn and Purpura and Dr. Housepian are also engaged in clinical studies on cortical activity evoked by thalamic stimulation and the clinical responses in patients treated surgically for parkinsonism and other dyskinesias.

Professors Goldensohn, Purpura, Drs. Housepian and Giovanni Marini, Research Assistant in Neurological Surgery, have been engaged in a pharmacological analysis of slowly changing voltages of the brain which accompany focal cortical seizure discharges in experimental animals. They have also continued screening studies of potential anticonvulsant compounds on experimentally induced paroxysmal activity.

Professor Goldensohn and Dr. Gerhard Nellhaus are engaged in a study of changes in the electrical activity of the brain in neurological disorders caused by inborn errors of metabolism. Professor Goldensohn and Dr. Stanley Fahn are examining the natural history of changes in manifestations of epilepsy in patients whose seizures began in childhood and who have been followed in this hospital for a minimum of ten years. Professor Goldensohn, Dr. Abraham Chutorian and Mr. Zablow are making a preliminary survey on patterns of respiration in neurological disorders. Professor Goldensohn and Dr. Alanson Hinman continued their studies on the effects of adrenal corticoids on children with infantile spasms associated with characteristic electroencephalographic abnormalities.

Professor Joseph Moldaver continues his studies on facial nerve injuries in cooperation with Dr. Edmund P. Fowler, Jr., Professor of Otolaryngology and Director of Service. He has also studied the electrical reactions in members of the families of patients with myotonic dystrophy. The findings are of value in the study of the genetics of the disease.

The Pediatric Neurology Service under Professor Sidney Carter has continued an active service load both on an in-patient and out-patient basis. In June three of the Fellows completed their training and assumed the following academic positions: Dr. Hinman as Assistant Professor of Pediatrics at Bowman Gray Medical School; Dr. John H. Menkes as Assistant Professor of Neurology at Johns Hopkins Medical School and Dr. Raymond Chun as Instructor in Neurology at the University of Wisconsin Medical School.

Professors Carter, James H. Hammill and Ransohoff are analyzing the case records of 500 children with brain tumors. With Professors Rowland and Hammill, Professor Carter is studying children diagnosed as amyotonia congenita in early infancy and with Dr. Arnold P. Gold, he has initiated a study of the vascular malformations of the brain in children.

Professor Carter continued to serve as a Director of the American Board of Psychiatry and Neurology, as Chairman of the Professional Advisory Council of United Cerebral Palsy of New York City, as Trustee of the American Academy of Neurology, as a member of the Council of the American Epilepsy Society and as a member of United Cerebral Palsy's Clinical Advisory Committee.

Professor Daniel Sciarra is participating in a cooperative study on the chemotherapy of glioblastomas with Professor Pool and Dr. Alfred Gellhorn, Professor of Medicine and Associate Attending Physician.

Professors Yahr and Hammill, in association with Professors Pool, Lester A. Mount, Associate Professor of Clinical Neurological Surgery and Associate Attending Neurological Surgeon, and Professor Ransohoff continue the collection of data concerning subarachnoid hemorrhage and intracranial aneurysms as a unit of the National Cooperative Study regarding these entities. Over

350 cases have been processed since its inception in September 1957.

Professor Yahr is studying the distribution of dilantin in plasma and cerebrospinal fluid in the normals and in patients with convulsive seizures in association with Professor Robert A. Fishman and Dr. Howard Triedman. The results indicate that uniform plasma levels of dilantin were best obtained by a dosage schedule at twelve hour intervals. No correlation with serum levels and therapeutic effect was noted, though toxicity did show such a correlation. In association with Dr. Gold, Professor Yahr is making a clinical pathological study of the central nervous system manifestations in disseminated lupus erythematosus. Professor Yahr, Dr. Donald H. Harter and Professor Elvin A. Kabat have reviewed all the records of patients with an elevated gamma globulin in the cerebrospinal fluid. It is planned to further delineate the site of gamma globulin production using fluorescein labeled antibody techniques.

Professor Yahr was elected a member of the United States Pharmacopeia Revision Committee for the coming 1960-1970 decade, was reelected Secretary-Treasurer of the American Neurological Association and continued to serve as a member of the Neurological Study Section of the National Institutes of Health.

During the past year, Professor Rowland and Dr. David Shemin, Professor of Biochemistry, have been studying the enzymatic basis for the conversion of delta-aminolevulinic acid into succinic acid and a one-carbon fragment. The possibility that acute intermittent porphyria with its neurologic and psychiatric symptoms is due to an enzymatic defect at this level is being evaluated. In an attempt to study the metabolic role of Vitamin B₁₂, Professors Rowland and Shemin have also been studying the fate of isotopically-labeled beta-methyl aspartic acid.

Professor Rowland and Dr. Erich Hirschberg, Assistant Professor of Biochemistry, have measured the activity of various serum enzymes and found them to be consistently elevated in the Duchenne form, but not in other forms of muscular dystrophy. Professor Rowland, Drs. Nicholas P. Christy, Associate in Medicine and Assistant Physician, Kenneth Sterling, Research Associate in Psychiatry and Assistant Physician, and William D. Drucker, Assistant Physician, have com-

pleted a study of endocrine function in myotonic muscular dystrophy.

Professor Fishman, in collaboration with Dr. Christy, is studying the exchange of adrenal steroids between plasma and spinal fluid in normal dogs and in dogs treated with corticotrophin. Professor Fishman with Dr. Milton R. Porter, Associate Professor of Clinical Surgery and Attending Surgeon, and Dr. Paul H. Gerst, Resident in Surgery, is studying magnesium metabolism in hypo-magnesemic states secondary to excessive gastrointestinal loss of this ion. A method for studying cerebrospinal fluid for alterations in amino acid content using paper chromatography has been utilized by Professor Fishman to screen the fluids of patients with heredo-degenerative diseases of the nervous system with the hope that a lead to a metabolic defect might be obtained. About seventy-five patients have been studied to date. A method for the analysis of cerebrospinal fluid proteins with regard to their electrophoretic components has been utilized by Professor Fishman to study a number of disorders associated with abnormal cerebrospinal fluid proteins. Multiple sclerosis and infectious polyneuritis have been of particular interest. This method may prove to be valuable in routine clinical work as a method for quantifying gamma globulin content, as well as the other protein fractions.

Professor Fishman is analyzing the water, sodium, potassium, chloride and blood content of the cerebral cortex of brains reduced in volume owing to obstructive hydrocephalus. The chemical characteristic will be correlated with morphological changes studied with electron microscopy, in collaboration with Dr. Virginia Tennyson, Instructor in Anatomy, and Dr. Melvin Greer. Animals with hydrocephalus induced by Vitamin A deficiency and with obstructive hydrocephalus induced with kaolin are also under study. These techniques are also being applied to the problem of "cerebral edema" by studying human brain tissue obtained in the operating room.

Professor William F. Caveness with Dr. Kai C. Nielsen reported the sequelae of cerebral concussion as they occurred in cranio-cerebral trauma from the Korean campaign. In continuing his studies of head injuries, Professor Caveness reviewed with Professors Peter B. Ascroft of London University and W. Ritchie Russell of

Oxford University their original data from World War I and World War II respectively. This will serve as a basis for a longitudinal analysis of post-traumatic epilepsy.

Professor Caveness and Dr. Nielsen, with Professors Raymond D. Adams and Paul I. Yakovlev of Harvard University reported the ontogeny of induced focal seizures as part of their continuing study of the developing brain in the Macaca Mulatta. Professor Caveness in collaboration with Professors Gertrude van Wagenen of Yale University and Donald B. Lindsley of the University of California, Los Angeles, reported a comparison of the developing electroencephalogram in man and monkey. Professor Caveness was elected President of the American Epilepsy Society.

At Montefiore Hospital during the year, Professor Tiffany Lawyer, Jr. has been concerned with the use of amphotericin B in the treatment of fungus diseases of the central nervous system. He has also been evaluating oral anti-diabetic agents in the treatment of multiple sclerosis.

Professor Arnold P. Friedman has continued the evaluation of pharmacologic agents in the treatment of headache. Investigations of the relation of neurohumoral agents and urinary amino acids to migraine have continued to engage his attention during the year. Professor Friedman has also been concerned with the relation between blood flow through muscle and tension headache.

Professor Seymour Solomon, in conjunction with Professor Friedman, has been investigating electroencephalographic abnormalities in patients with headache. Professor Solomon and Dr. David I. M. Fine have been evaluating the effect of drugs on spasticity of skeletal muscle.

During the year 1960 the Division of Neuropathology under Professor Abner Wolf did the following: eighty-three autopsies from Neurological Institute, 229 brain examinations from Presbyterian Hospital and Harkness Pavilion, 239 brain examinations from Babies Hospital and Sloane Hospital, 183 fresh tissue examinations at operation and 634 surgical biopsies from Neurological Institute.

Dr. Emanuel M. Stadlan, together with Dr. Murray Bornstein, has begun a program of research on experimental allergic encephalomyelitis and neuritis. Dr. Stadlan is also carrying out

a study of diphtheritic neuritis, utilizing the Coons technique. Dr. Elliott M. Marcus, in collaboration with Professor Purpura, is studying the effects of some steroids upon electrical activity of the brain and plans to pursue the study of the histological material in his animals. Dr. William F. McCormick, using the Coons technique, is beginning a study on prenatal infection of the central nervous system.

The investigations of perinatal pathology of the central nervous system by Professors Wolf and David Cowen and Dr. Lester M. Geller have continued. Their studies of brain wounds in the neonatal animal, of the effects of electrical stimulation of the brain of the neonatal animal, of some properties of tissue with respect to passage of an electric current, and of the effects of an anti-metabolite (6-aminonicotinamide) upon the developing and mature nervous system of the rat are also continuing. A study of the long-term pathological effects of prenatal exposure to x-radiation upon the central nervous system of the rat was recently completed by Professor Cowen and Dr. Geller. Dr. Joo H. Sung is continuing his study of the late effects of radiation on the rat and human brain. Dr. Sheila Donahue has carried out an electron microscopic study of the blood vessels in the neonatal rat brain and is planning to continue the study of other structures at this stage of development of the nervous system. Dr. Paul Anderson has developed a new technique for the histochemical demonstration of the acid hydrolases. Two papers on the relation between voluntary salt consumption and consummatory behavior in the rat, by Dr. Geller, Dr. Hans Kaunitz, Research Associate in Pathology, and Miss Ruth Johnson are in preparation. A comparative study of the similarities and differences between rats and cats in their preference for different concentrations of salt solution and in certain other aspects of consummatory behavior is now under way.

In association with Professor John S. Tucker of the College of the Pacific, and Professors J. Harold Severaid, Sacramento State College, and Chaille M. Love of Sacramento State College Foundation, Professor Frederick A. Mettler has been investigating a plant, *Centaurea solstitialis*, which has been implicated in connection with "star thistle disease," a pallido-nigral necrosis of

horses. The disorder in horses occurs after the animals have consumed two to three times their body weight of the plant. About this time the animal develops infarcts of the nigra and pallidum and the animal is incapacitated for further self-sustaining existence. Since it was felt that there was a possibility that the pathologic process might be useful as a means of reproducing lesions of interest in parkinsonism, monkeys were shipped to California and placed upon varying amounts of thistle diet. In addition a colony of rats was fed on the fresh plant and the dried plant was collected and prepared in the form of a dry feed. A colony of rats has been maintained upon 100 per cent dried thistle for over two months without producing any specific neural abnormalities. In the case of the monkeys it has been found possible to get as much as forty per cent fresh thistle into the animals' diet without having the animals stop eating. With diets of this concentration no abnormalities have developed in monkeys and no pathological changes have been found in the brains. Star thistle disease would seem not only to be highly specific for horses but also peculiar to the Sacramento Valley. Thus, although this plant grows in the mountains of Spain, France, Italy and Greece, detailed inquiries from government sources in these areas have failed to reveal the existence of the disorder. In association with Mr. Douglas Ramsay, a graduate student, the rat colony which has been on the thistle diet is being tested for any abnormalities in neural function at the psychologic level. In association with Dr. Robert Thompson, Professor Mettler has continued the investigation of the relationship between striatal function and learning and retention.

Professor Mettler in collaboration with Dr. Thompson and Mr. William J. Ayers, has shown that conditioned spaced-responding (a type of timing behavior) and some simple visual discriminations are profoundly disturbed by striatal injury. Furthermore, Cebus monkeys do not appear to exhibit the locomotor hyperactivity typical of rhesus monkeys with striatal damage. Work in progress is examining the generality of the results for other primate and infra-primate species, and under varying experimental conditions.

Earlier findings in cats of deficiencies in conditioned avoidance and food-seeking patterns asso-

ciated with striatal lesions are also being extended to primates. Mr. Arnold Hyman and Mr. Ramsay are assisting Dr. Thompson in this work.

Preliminary exploration of the applicability of operant conditioning methods to the analysis and control of hyperkinesia in the primate has been initiated by Dr. Thompson.

The neurochemistry section of the department continued under the direction of Professor David Nachmansohn its research on the chemical and molecular basis of nerve activity.

One of the most striking advances were the observations on local anesthetics. Procaine is analogous in structure to acetylcholine and it has been long postulated that it blocks electrical activity by competing with acetylcholine for the receptor protein. Recently, Drs. Philip Rosenberg and Henry Higman, United States Public Health Service Trainees, tested a series of local anesthetics on the electroplax. They found a strongly increasing effect using procaine, tetracaine and dibucaine. Professor Seymour Ehrenpreis and Miss Margery G. Kellock, a visiting student from Scotland, tested the affinity of these three compounds to the receptor protein and found a reaction which was highly specific in character. Moreover, the affinity *in vitro* parallels the effectiveness to block electrical activity in the living cell. These observations show that local anesthetics produce their effect by their specific reaction with the acetylcholine receptor protein and offer dramatic support for the theory that the generation of bioelectric potentials is inseparable from the action of acetylcholine on the receptor protein.

Another powerful support for the theory came from experiments with curare. Dr. Wolf Dietrich Dettbarn has shown that at the Ranvier node of a single isolated sciatic nerve fiber of frog, where the barrier is very thin, curare blocks rapidly and reversibly axonal conduction. Dr. Rosenberg and Professor Ehrenpreis tried to reduce the lipid barrier of squid giant axon by chemical methods. Among a variety of enzymes tested, cobra venom proved to produce the desired effect. After exposure of the axons to cobra venom in concentration of ten mg/ml, which by itself had no effect on electrical activity, curare, inactive before the treatment even in very high concentration (ten mg/ml), had a powerful, rapid and reversible

effect on the electrical activity of the axon. The active enzyme (or enzymes) of the venom has not yet been identified, but it is probably phospholipase A.

Professor Ehrenpreis in collaboration with a fourth year student, Mr. Stanley Cohen, has prepared antibodies to the receptor protein. Using fluorescent antibody fixation, the antibody was found to be localized exclusively in the region of the membranes of electroplax as well as of axons of the spinal cord.

Some of the extremely toxic agents produced by certain marine animals have been tested as to their effect on electrical activity at Ranvier nodes and of the monocellular electroplax preparation. One of these agents, a poison extracted from puffer fish and available in rather pure form, having a molecular weight of 350, proved indeed more powerful in blocking electrical activity than any other chemical compound tried. It blocks activity at a single Ranvier node of a single frog sciatic nerve fiber at a concentration of 1/10,000 and one mg/ml. Since the surface of a node is about twenty-five m^2 , only an extremely small fraction of a milliliter will be in contact with the Ranvier node, probably much less than one millionth. This shows the powerful action of this toxin. The toxin has no affinity to the proteins of the acetylcholine system and acts therefore most likely on other constituents of the conducting membrane essential for conduction.

Professor Francis C. G. Hoskin and Dr. Dettbarn have designed a new type of Warburg vessels which makes it possible to study the oxygen uptake and CO_2 output of resting and stimulated fibers and analyze at the same time intermediary pathways by using C^{14} labeled glucose-1 phosphate and glucose-6 phosphate. Methods are being developed to follow the fate of glucose and the possible transformations into amine acids, phospholipids, etc. Improved methods of phospholipid fractionation have been worked out by Mr. Harry Dougherty who has analyzed the various types of phospholipids present in electric organ and compared them to those present in crustacean fiber and mammalian brain.

Dr. Allen Gold, United States Public Health Service Trainee, has made considerable progress in developing new methods for the study of "geometry" of the active site of acetylcholine-

sterase. Dr. H. Claire Lawler has continued her studies on the properties of the protein of acetylcholinesterase. Dr. William H. Harrison, United States Public Health Service Trainee, has extracted an enzyme from adrenal glands which forms adrenaline by methylating noradrenaline. He is now engaged in purification of this enzyme.

Professor Irwin B. Wilson, Drs. Leon T. Kremzner and Sara Ginsburg have been studying mammalian histidine decarboxylase. The enzyme has been purified some 500 fold. The method for assaying histamine has been quite considerably improved.

A simple micro method has been developed for measuring cholinesterase — the amount of a single node or Ranvier. Carbamyl derivatives of acetylcholinesterase were shown to be formed by reaction with carbamates of pharmacological and medical interest.

Studies in the theory of enzyme kinetics by Professor Wilson have explained combined competitive-noncompetitive inhibition and have also explained substrate inhibition. A new method for measuring enzyme turnover number has been developed.

Studies in the laboratory of neurophysiology under Professor Harry Grundfest during the past year have advanced considerably the theoretical grasp on fundamental mechanisms of bioelectrogenesis.

Analysis of the mechanisms by which the normally graded responses of arthropod muscles are converted to spikes carried out with Professor Robert Werman and Dr. John P. Reuben have revealed the considerable degree of independence of four components of electrogenic activity. Three of them, termed sodium-activation and -inactivation, and potassium-activation, had been introduced by Professor A. L. Hodgkin of Cambridge University. The present work has emphasized the occurrence of potassium-inactivation as a fourth factor that had been suggested earlier by Professor Grundfest. The new formulation encompasses explanations for a wide range of phenomena in electrically excitable membranes that had hitherto been unaccounted for.

Comparative studies on various arthropod muscles with Dr. Reuben and Dr. Lucien Girardie have disclosed a remarkable diversity in the pharmacological properties of electrically excitable

membrane in closely related species. Professor Michael V. L. Bennett has shown that different parts of single electroplaques may give rise to distinctive electrical activities. Thus the several electrogenic components may have different kinetics in different parts of a single cell.

Professor Werman has been able to demonstrate directly the existence in the frog muscle endplate of electrically inexcitable synaptic patches. These synaptic patches are of microscopic dimensions and are interspersed with electrically excitable, conductile membrane. It has also been shown that the electrically excitable delayed rectification of *Raia* electroplaques and of frog slow muscle fibers is distinct from the electrically inexcitable depolarizing activity of these cells.

Of considerable potential value is the discovery that crustacean neuromuscular synapses develop inhibitory as well as excitatory spontaneous "miniature" potentials, and the finding of methods to modify this activity. Employing this new index, Professor Grundfest and Dr. Reuben showed that the extremely potent "clam poison" produced by dinoflagellates does not block synaptic membrane, nor the release of transmitter agents by the nerve terminals. The poison apparently acts by blocking conductile activity in the nerve fibers.

Dr. Akira Watanabe completed study of the ephaptic junctions in the lateral giant axon system of crayfish. Professor Bennett has studied more extensively the ephaptic connections which he discovered among the supramedullary neurons of puffer. He has found and studied similar connections in the supramedullary neuron systems of cunner and goosfish. Dr. Reuben has demonstrated electrophysiologically the occurrence of ephaptic connections among the muscle fibers of various decapod crustaceans. He also obtained a theoretically interesting photodynamic activation of electrogenesis in these muscle fibers.

The studies with electron microscopic techniques on embryology, morphology and histochemistry of electroplaques are continuing, conducted by Mr. Robert F. Mathewson and Mr. Allan Wachtel of the Cell Research Laboratory at Mount Sinai Hospital. A program of research on analgetics is also being carried out at Mount Sinai Hospital, in cooperation with Professors

Joseph E. Fiasconaro and Harold Sherman of the Dental Faculty.

Professor Grundfest was elected a Foreign Member of the Academy of Sciences of Bologna, Italy; a member of the Neurophysiology Panel of the International Brain Research Organization, and a member of the Council of the Society of General Physiologists.

The Immunochemical Laboratories under Professor Kabat are administered jointly under the Departments of Microbiology and Neurology. The antigenicity of polysaccharides in man, the structural basis of immunochemical specificity, the structure of the blood group A and B substances and the gamma globulins of cerebrospinal fluid are among the long range studies under investigation.

By a comparison of the inhibiting power of the set of isomaltose oligosaccharides up to isomaltoheptaose which were prepared at the Lister Institute, Professor Kabat could definitively establish that the antibody combining site of human antibody to dextran had an upper size limit complementary to a hexa- and heptasaccharide.

In studies with Dr. Joel W. Goodman, who is now Assistant Professor of Microbiology at the University of California, a sequence of five glucoses linked α 1,6 could fit into a cross reacting antibody combining site for both horse and rabbit type II antipneumococcal antibody, establishing a minimum size for the antibody combining site in this cross reaction comparable to that for the human antidextran. Mrs. Rose Mage, a graduate student in Microbiology, has studied the homologous dextran-rabbit antidextran reaction and found that the upper limit for the antidextran combining site in this species was the same as that in the human.

By immunizing humans with a variety of other dextrans of different structures and with higher proportions of α 1,4, α 1,3 and α 1,2 linkages, antibodies specific for these linkages could be obtained. Miss Ada E. Bezer and Professor Kabat are continuing earlier studies with Dr. Peter Z. Allen, now at the University of Rochester, on the specificity of antibodies to these dextrans. These immunochemical studies offer the possibility of determining portions of the structure of unknown polysaccharide antigens when only very small amounts of material are available.

Dr. Stuart Schlossman, Visiting Fellow under a Fellowship from the National Foundation and Professor Kabat are trying to purify antidextrans and the fractions of antipneumococcal antibodies which cross react with dextrans with the hope of separating antibodies of various sized combining sites.

Professors Gerald Schiffman, Kabat and Mr. William Thompson are continuing their efforts to isolate oligosaccharides from blood group A, B and O substances which possess the determinants of blood group specificity. A variety of new fucose containing oligosaccharides have been obtained from blood group B substance none of which were active, and a number of oligosaccharides obtained from A substance by mild acid hydrolysis are now under investigation.

Dr. Donald Marcus, Visiting Fellow on a Helen Hay Whitney Foundation Fellowship, is trying to purify the various enzymes from cultures of *Clostridium tertium* which destroy blood group A substance and those which destroy the cross reactivity of the blood group substances with type XIV antipneumococcal antibody.

Dr. Maria L. Zarnitz, a former Visiting Fellow as a Rockefeller Foundation Fellow and presently at the Max Planck Institut für Biologie, Tübingen, and Professor Kabat were able to show that a α -galactosidase from coffee beans obtained from Professor J. E. Courtois in Paris, specifically hydrolyzed only galactose from the blood group B substance with loss of activity.

During the academic year 1959-1960, Professor Kabat was on a sabbatical leave in the laboratory of Dr. Pierre Grabat at the Institut Pasteur, Paris, where he completed the second edition of Kabat and Mayer's Experimental Immunochimistry. In February, 1960, he returned for a few days to deliver a William Pyle Philips

Lecture at Haverford College, Haverford, Pennsylvania.

Professor Kabat is presently serving on the Committee on Transplantation, the Subcommittee on Plasma and an Ad Hoc Panel on Rh Nomenclature of the National Research Council, the A.I.B.S. Biochemistry Advisory Panel to the Office of Naval Research, the Germ Free Life Institute of Notre Dame University and the Medical Advisory Board of the National Multiple Sclerosis Society.

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Nursing

ELEANOR LEE, *Professor and Chairman of the Department*
Director of Service

Undergraduate Program

In September, 1960, 148 students, the largest class in the history of the school, were admitted. This is an increase of twenty students over the last two entering classes averaging 128. These 148 candidates came from eighty-four colleges and universities and twenty-one states and were selected from 364 applicants. This increase in applicants is due to the public health accreditation received in December 1959, the availability of more scholarship aid as well as the increased enrollment of young women in colleges.

Recruitment programs in several colleges were arranged in which both faculty and students participated and an open house was held at Maxwell Hall in April for college students and faculty members.

Seventeen college graduates entered in September 1960. They are the first group to be enrolled in the new twenty-four months nursing program. Continued curriculum development has made possible an increase in the time credit allowed to applicants presenting an acceptable baccalaureate degree as the basis of admission to this professional program. The new program covering two academic years and two summer sessions increases the time credit by one semester thus shortening the program to twenty-four months. The recruitment of more college graduates for nursing should result from this new program.

Since 1937 a total of 2,124 degree students have been admitted to the Department of Nursing. A summary of this group during the period 1937-1960 indicates 334 withdrawals or fifteen and seven-tenths per cent attrition rate.

A total of 126 students or thirty-three per cent of the students enrolled received scholarship aid. Ninety-eight students received a total of \$24,483. Twenty-eight students had been awarded New York State Regent Scholarships before they entered the Department of Nursing totalling approximately \$15,200.

The Vivian B. Allen Scholarship was awarded to four entering students. Three students received assistance from the Margaret E. Conrad Scholarship Fund. The Jane McAllister Scholarship was given to two students. One student was given scholarship aid from the Mary S. Specht Scholarship Fund. For a second year, a benefit bridge was held in March, 1960 and the proceeds deposited in the Special Scholarship Fund #2. Twenty students received help from this fund. Scholarship aid from the proceeds of the Columbia Thrift Shop was given to two students in the Class of 1961. Thirteen students were assisted by the Gustavus and Louise Pfeiffer Foundation assistance for scholarships. A member of the Class of 1962 was awarded the Nancy Whitman Wadsworth Scholarship. One student received aid from the scholarship given by the Women's Florist Telegraph Association.

A new scholarship was established by Mr. Landsdell Christie through two generous gifts, through the courtesy of Dr. Franklin M. Hanger, Professor Emeritus of Medicine. Full tuition scholarships were awarded at the September registration to thirteen students. In November, 1960 the Samuel J. Moritz Scholarship was established from the estate of Samuel J. Moritz. The income from this fund will be used annually for tuition scholarships. Assistance was given to two students from the Dean Sage Scholarship. Two scholarships were awarded to entering students in September from the Frederick Sturges, Jr. Scholarship. The William Holloway Scholarship made awards to six students. The students were assisted by the Robert Bacon Whitney Scholarship. The Greer Scholarship assisted two students. Twenty-eight students were awarded New York State Scholarships.

A total of \$2,000 given by the Alumnae Association, Presbyterian Hospital School of Nursing, was awarded in July to fifteen students.

A visit was made by two representatives of the New York State Education Department, Division

of Professional Education on May 25th and 26th. The visit included a series of conferences with faculty relative to over-all planning, the several areas of curriculum, student personnel services and nursing services, visit to selected clinical areas and a meeting with representatives of the student body. The last visit had been made in 1953.

The eighth edition of Lippincott's Quick Reference Book for Nurses had been completed in December for publication in the spring of 1961. This new edition was prepared under the direction of Associate Dean Eleanor Lee as Editor with the following author panel from the faculty: Professors Elizabeth Gill, Helen F. Pettit and Dorothy E. Reilly, Misses Beth Cameron, Dolores Farrell, Louisa Kent, Carolyn Dawson and Glenna Fregia and Mrs. Marcia Gatchall. The royalties from this book are received by the Alumnae Association of the School of Nursing for scholarship funds.

An oil painting of six nursing seniors entitled "Senior Seminar" was presented to the School of Nursing by Messrs. F. Trubee Davison and Henry P. Davison, Mrs. Artemus Gates and Mrs. Ward Cheney, in honor of their mother, Mrs. Henry P. Davison.

The Committee on Instruction, with Professor Reilly as Chairman, has held monthly meetings and accomplishments have been outstanding this year. The First Year Faculty Committee under the leadership of Professor Gill revised the nursing content of the first year courses which started in September.

In the Class of 1960, 110 candidates completed the State Board Examinations for licensure in New York State in June, 1960.

The "Report on Public Health Nursing Field Work in Basic Baccalaureate Programs" was published in July 1960. This study conducted under a two-year grant from the United States Public Health Service 1957-59 was continued through June 1960, by Miss Gloria Dammann, Assistant Professor of Public Health Nursing Practice, as project director. This joint faculty appointment in the School of Public Health and Administrative Medicine and the Department of Nursing for the academic year 1959-60 was made possible through the generosity of Professor Ray Trussell. The direct participation and advisory service of

Dr. Morris Zelditch, Jr., Assistant Professor of Sociology at Columbia University, have been of great value to the research staff during the three year period of the study, in which the faculty participated in many ways. A major contribution was made in establishing patterns of field practice, developing and implementing various tools used in evaluation and preparing significant data on competencies.

Graduate Program

The fifth class of the graduate program in maternity nursing completed the eleventh months course in August. Of the eight students enrolled six graduate nurses were awarded the Master of Science degree from Columbia University in October and the Certificate in Midwifery from the Maternity Center Association. Professor Trussell and the faculty of the School of Public Health and Administrative Medicine have arranged an excellent program for the first and second quarter in cooperation with Professor Mary I. Crawford and Eunice K. MacDonald of the Department of Nursing. Through the generosity and interest of Professor Trussell six United States Public Health Service Traineeships were made available again this year to six graduate nurses in this program.

Dr. Howard C. Taylor, Jr., Professor of Obstetrics and Gynecology and Attending Obstetrician and Gynecologist, and the attending and resident staffs of Sloane Hospital have given assistance to this program. Miss Hazel Corbin, Director of the Maternity Center Association, and the teaching staff have contributed to the success of this program. The financial assistance in faculty salaries and in tuition aid for one student has been most generous and is acknowledged with gratitude.

The annual meeting of Directors of affiliating Schools was held in Maxwell Hall on March 24, 1960. The total number of affiliating students for 1960 totalled 355 from sixteen different schools.

Mental Health Training Program

In 1956 a Mental Health Training Grant was awarded by the National Institutes of Health to the Department of Nursing for a five year period: "To improve and extend the content and experiences related to mental health that should be of-

ferred to a student of professional nursing to assist in preparing her to give comprehensive care." A progress report has been sent annually.

Professor Betty B. Jones, mental health faculty member, has participated in the total curriculum planning and considerable progress has been made during this year. The assistance given by Dr. William Watson to the mental health project was most appreciated by the faculty and students. In August 1960 Dr. Bernard B. Schoenberg, Instructor in Psychiatry, was designated by Dr. Lawrence C. Kolb, Professor of Psychiatry, to succeed Dr. Watson. The cooperation and interest of Professor Kolb is very much appreciated in making available a group of psychiatrists and sociologists to teach in the nursing program. Special mention should be made of the valuable contribution made by Professor Zelditch, for his assistance to the nursing faculty both in teaching and research. As a result the mental health content of the first year curriculum has been improved. A workshop for the first year nursing faculty in September preceded the teaching program and seminars are continuing with a psychiatrist and sociologist as members of the group. The psycho-social content has proved valuable in the patient care conferences led by the nursing instructors for first year students in six groups on the four general medical and surgical services. A psychiatrist and sociologist as resource persons participate in each group.

Beginning this autumn throughout the curriculum of the second and third years, psychiatrists and sociologists are participating in the nursing teaching. A revised curriculum in psychiatric nursing was developed this year and started in May 1960. Mrs. Kathryn Lawrie assisted Professor Jones as a member of the mental health project staff for a six month study working with the psychiatric nursing faculty. The current emphasis on the behavioral and social sciences in the curriculum throughout the first and second years of the program greatly influenced the design and content of the new psychiatric nursing course.

Academic Appointments and Promotions

Miss Eleanor Speer was appointed Instructor to replace Miss Phyllis Molle who resigned. Miss Lydia A. Bosanko was promoted to Associate in

Nursing to replace Miss Lorraine Jacobson who resigned. Miss Eunice C. Messler was appointed Associate in Nursing to replace Miss Eloise V. Cutler who resigned. Mrs. Mary Wasson Britten was appointed Associate in Nursing to replace Miss Marianne Pieck. The following were appointed Instructors in Nursing: Lorraine Betz, Joanne L. Heinly, Doreen A. Kolditz, Suzanne M. Law, Jean B. Gunn and A. Ruth Rayner. Miss Jane Ann Traver was appointed Assistant in Nursing. Eunice K. Macdonald was appointed Assistant Professor of Nursing and the Misses Carmela Cavero and Glenda L. Fregia were appointed Instructors. The Misses Margaret M. Tween and Catherine Able were also appointed Instructors.

Staff Changes on Nursing Service

During the year 1960, 489 new appointments were made to the professional nursing staff, twenty-five of this number have been employed here previously. Resignations during the same period totaled 378, of which 313 were staff nurses. The turnover rate for general duty nurses for the first eleven months was forty-eight per cent as compared with fifty-four per cent for 1959. The 1960 turnover rate for head nurses was thirty per cent as compared with thirty-six per cent last year.

On November first a summary of 590 general duty nurses indicated that eighty-three per cent are graduates of 227 schools of nursing from thirty-three states, including Puerto Rico; seventeen per cent from eleven foreign countries, including forty-five nurses from England, thirty-eight from Canada and fifteen from Ireland, two from Scotland and one each from seven other foreign countries; twelve per cent are graduates of the Department of Nursing; five per cent are graduates of schools of nursing whose students affiliate here for instruction and practice, mainly in pediatric nursing; fifteen per cent are married; twenty per cent hold a baccalaureate degree and seventy-four general duty nurses are studying part-time during this Autumn semester.

Special mention should be made of the increased number of graduate nurses on the staff throughout this year. Additional positions for graduate nurses were authorized due to the new developments, such as the opening of the psy-

chiatric unit. All positions were filled, with the exception of July and August when there were fewer than fifteen vacancies.

In January three additional staff nurse positions were authorized for the Babies Hospital eleventh private floor, which provided three additional nurses for evening and night duty. Because so much of the additional nursing load has resulted from the care of children with neurological conditions, one nursing position was transferred from the neurological service. Thus an additional graduate nurse was assigned to day duty on the eleventh floor of Babies Hospital.

In February a new plan was started to provide additional nursing care, post-tonsillectomy, during both evening and night hours, for children in the semi-private four-bed unit on Babies Hospital fourth floor. This additional care has been given by two specially trained nursing aides who stay in the four-bed unit with the children from the time of transfer from the recovery room until eight o'clock the following morning.

On March first, the two operating rooms on the third floor of Vanderbilt Clinic were converted into permanent areas for major surgery. Seven additional graduate nurse positions were authorized. All nursing positions in the operating rooms have been filled since February and the turnover for 1960 has been decreased considerably over the previous years.

Under the leadership of Miss Martha E. Haber, Assistant Director of Nursing Service, the new psychiatric unit in Neurological Institute was opened March sixteenth, with Miss Marilyn L. Truitt as Supervisor. Miss Truitt had been a member of the nursing staff of the New York State Psychiatric Institute for seven years. The full nursing staff for this unit required three nurses for the day and evening staff and two for night duty, in addition to two attendants and one nursing aide during each eight hour period.

The increased differential for permanent evening and night duty of six months or more was effective in maintaining an average, for 1960, of 213 nurses. Of these, 123 were on evening duty and 90 night. The 1959 average was 207 nurses.

In the Registry the average number of private duty nurses on duty during this year was 206: ninety-three for day duty, fifty-three for evening duty, and sixty for night duty. A marked decrease

is evident in the number of private duty nurses available from the Registry. The number of unfilled calls for 1960 was 500 fewer than in 1959 and more than 1,000 fewer than in 1958, due to the employment of additional nurses for special assignment.

In Harkness Pavilion the employment of additional staff nurses above the authorized quota, for special assignment to patients for whom private duty nurses are unavailable, has provided the nursing care needed by acutely ill patients, especially during the evening and night hours. During eleven months a total of 7,846 calls for private duty nurses for patients in Harkness Pavilion were filled by staff nurses on this special assignment plan.

The four group-nursing units have continued to meet the nursing needs of patients requiring intensive nursing care. Nine graduate nurses are assigned to the two four-bed units for semi-private patients on 11-Annex, Harkness Pavilion. Two units in Babies Hospital, one on the fourth floor and the other on the ninth floor (surgical), are staffed by a minimum of nine graduate nurses.

The special unit for the care of patients following cardiac surgery has continued to attract graduate nurses interested in this specialized nursing care. The cooperation of Dr. George H. Humphreys II, Valentine Mott Professor of Surgery and Attending Surgeon, and Dr. James R. Malm, Assistant Professor of Surgery and Assistant Attending Surgeon, is very much appreciated.

The non-professional group, constituting forty per cent of the total nursing staff, has made a fine contribution in assisting the professional nursing staff in the care of the patients. The turnover rate for the year 1960 for the group of 237 nursing aides was twenty-five per cent compared with twenty-nine per cent last year.

The new nursing aide uniform, aqua in color and improved in style, was worn for the first time early in June. In-service training for the new nursing aides employed during this year has been given to six groups. A monthly in-service program for all auxiliary nursing personnel has been arranged by Misses Lillian A. Oring and Patricia A. Manes on such topics as interpersonal relationships, the new central food service, and other service departments of the hospital.

During July and August a group of thirteen

college aides were employed and given a special orientation program in nursing. Nine were assigned as nursing aides to the medical and surgical services, two to neurological, and one each to the operating room and the orthopedic service.

Twelve Red Cross volunteer nurses' aides completed the evening course of forty-two hours in November. Miss Manes taught the classes and also supervised the practice on the wards, which was planned concurrently with the theory rather than following all of the classes as previously. Volunteers have contributed in every way to assist the nursing staff. A series of classes for the candy strippers was held in Babies Hospital this Fall.

Miss Ruby Ollis, Supervisor, Harkness Pavilion 8th floor, retired after thirty-five years of service having been appointed head nurse in Sloane September 1, 1925. Miss Ollis helped to set up the private obstetric service when Sloane Hospital moved to the Medical Center.

Miss Elna Saamanen, a member of the nursing staff since her graduation from the school of nursing in 1930, received a decoration, "Order of the Lion," from the President of Finland, her native country. The presentation was made by the Consul General at the Finnish Consulate General in New York on November 29, 1960. Among the guests were, Miss Killiki Pohjala, delegate to the United Nations Security Council, and the Misses Lee, Marion D. Cleveland, Marjorie Peto, Cora Shaw, Margaret Wells and Kari Ellingsen from the Hospital. Miss Saamanen will retire February 1961 from the nursing staff of the Hospital.

In October Miss RoseMary Hoynak was appointed the nursing representative of the Pharmacy Committee of the Medical Board.

Staff Activities

Members of our faculty have attended and participated in several meetings and conferences throughout the country during the year. Among these were: The New York State Education Department meeting to consider the proposed revision of the Guide for Nursing Education program in the state and discuss the awarding of credit value for clinical programs; the West Point

Conference on Public Health Nursing; the meetings of the council member agencies for Baccalaureate and Higher Degree Programs; the National League for Nursing Accreditation; the State Education Department annual conference for Directors of Schools of Nursing; The American Public Health Association; the Forty-first Biennial Convention of the American Nurses' Association; the American Dietetic Association; the National League for Nursing Institute on Maternal and Child Health; the Eastern State Health Education Conference of the New York Academy of Medicine; the Nursing Section of the American College of Surgeons Convention; and the International Congress of Midwives in Rome, Italy.

Three hundred alumnae and nurses on the staff attended the nursing program during the first reunion of all groups of the Columbia-Presbyterian Medical Center on April 22. Misses Reilly and Oring were co-chairmen. Mrs. Robert H. E. Elliott, president of the Alumnae Association, welcomed the group. The theme was "Nursing Begins Its Second Century" and two panels were presented, "Nursing the Patient 1960" with Miss Cleveland as moderator and "Preparation of the Nurse 1960" with Miss Reilly as moderator. A fifty page report of these two panel presentations was published in The Quarterly Magazine of the Alumnae Association in the May issue.

During 1960, members of the nursing staff attended and took part in meetings of the American Hospital Association Institutes on Staffing Departments of Nursing and Evening Nursing Service Administration; Tuberculosis and Health Association; American Nurses Association, annual convention; Teachers College Workshops on Personnel Evaluation; New York State League for Nursing; National Association for Practical Nurse Education & Service Regional Workshops and annual convention; Licensed Practical Nurses of New York annual convention and the American Medical Association Clinical Meeting Program.

In October Miss Cleveland visited eight hospitals in Denver, San Francisco and Los Angeles. She met with the directors of nursing service and discussed problems of patient care.



Obstetrics and Gynecology

HOWARD C. TAYLOR, JR., *Professor and Chairman of the Department
Director of Service*

The year 1960 in the Department of Obstetrics and Gynecology, otherwise a successful and promising one, was saddened by the sudden death of Dr. Joseph W. Jailer, Associate Professor of Clinical Medicine and Associate Attending Physician. Professor Jailer had been in the department for eleven years, devoting his knowledge of the special techniques and new points derived from his broad training in anatomy, internal medicine, and clinical endocrinology to problems of human reproduction. Although the impetus which his work gave will last a long time, the place left by his death on August 23, 1960, will be all but impossible to fill.

Among the promising new developments in the department, several may be noted. Work on human genetics has been begun under a new member of the department, and a laboratory established for tissue culture and chromosome analysis. Another new laboratory has been organized for work on maternal-fetal blood type incompatibilities. Finally, a basis seems to have been laid for a better organization of the laboratories of obstetrical and gynecological pathology in relation to the Department of Pathology of the medical school.

Research

The research of the Department of Obstetrics and Gynecology has continued to be concerned with the manifold problems associated with the reproductive process. The work extends from the very fundamental levels of steroid biochemistry, tissue culture and chromosome analysis, and the changing enzyme patterns in blood and tissues during gestation, to the application of principles so derived, to the management of patients in the clinics and wards of the hospital. The description of the work will be given under the general headings followed in previous years.

Reproductive Biochemistry and Physiology

Intensive investigation of the role of steroids

such as aldosterone, progesterone and dehydroisoandrosterone continues in the laboratories of Professor Seymour Lieberman, Associate Professor of Biochemistry, assigned to Obstetrics and Gynecology, with whom Professor Raymond L. Vande Wiele is working in close collaboration.

The secretory rate of aldosterone has been studied with Dr. John Laragh, Assistant Professor of Clinical Medicine and Assistant Attending Physician, in about fifty patients with hypertension, the important observation being that patients with malignant hypertension almost invariably have elevated secretory rates of this hormone. The secretory rate of aldosterone has also been studied in pregnant women by Dr. Achiel Hendriks. In normal pregnancy, values which were five to ten times higher than those of nonpregnant controls were obtained, whereas in patients with toxemia of pregnancy, lower values were noted. The latter observation seems to indicate that aldosterone is not a major factor in the development of toxemias of pregnancy which are associated with edema and hypertension.

Other investigations in these laboratories have been directed toward the attempt of isolating in crystalline form, the tetrahydro metabolite of aldosterone. For this purpose tritium-labelled aldosterone has been administered by Dr. William G. Kelly in order to trace the metabolic fate of the hormone. As many as ten different metabolites of aldosterone have been detected. Dr. Erlio Gursipide is participating in this work by attempting to prepare the tetrahydro metabolite by partial synthesis.

Estimations of the progesterone secretion rates in normal and abnormal pregnancies have been made in a series of patients. The normal range of secretion in normal pregnancy appears to be between 255 and 500 milligrams per day. In a small number of patients studied, those with toxemia of pregnancy yielded lower values, an important observation, although final statements about the levels of progesterone in toxemia of

pregnancy must await the study of additional patients.

Other work in the laboratory has been concerned with the possible origin of dehydroisoandrosterone from 17-hydroxypregnanolone by Dr. Kenneth Roberts, the development of a rapid method for estimating dehydroisoandrosterone in human urine by Dr. Edward Bolte, and the effects of ACTH on the secretion of dehydroisoandrosterone. Dr. Paul C. MacDonald, a Josiah Macy, Jr. Foundation Fellow, is studying the nature of the androgen secreted by either adrenals or gonads of females with virilization. In a patient with a Leydig cell tumor of the ovary, the androgen responsible for the virilization and for the C-19-11 deoxysteroids in the urine was not dehydroisoandrosterone, as in the normal individual, but androstenedione or testosterone. In a patient with congenital adrenal hyperplasia, virilization studies led to the same conclusions, but in two patients with the Stein-Leventhal syndrome there was no detectable excretion of either of these substances.

In work begun under Professor Jailer and continued after his death by Dr. Donald A. Holub, Instructor in Medicine and Assistant Physician and Dr. Fred H. Katz, Visiting Fellow in Medicine and Assistant Physician, the effect of a potent progestational agent, 6-methyl-17-acetoxypregesterone upon pituitary and adrenal function in rats has been studied. It has been shown that significant depletion of pituitary ACTH concentration occurs following administration of this compound as well as profound adrenal atrophy. It has been shown by Drs. Katz and Marvin M. Lipman, who were also in the laboratories formerly directed by Professor Jailer, that elevated levels of 6- β -hydroxy-cortisol, a newly unconjugated urinary steroid, are present in the urine of patients with toxemia of pregnancy.

Dr. Orlando J. Miller has studied certain problems in human genetics by means of blood culture as a source of dividing cells and the analysis of chromosomes. Abnormal chromosomes have been found in a variety of intersexual and hypergonadal conditions. Continuing efforts are being made to relate gene loci to specific chromosomes by such techniques as linkage studies in families with chromosome abnormalities, such as translocations.

With Dr. Louise Lang Phillips, Dr. R. Nuran Turksoy has studied the influence of ovarian function on the fibronolytic system. It appears that women with normal ovulatory menstrual cycles exhibit a biphasic pattern of elevation of fibrinogen, profibrinolysin and inhibitors which corresponds closely to that of the estrogen excretion pattern. There is likewise an increase of profibrinolysin, inhibitors, and, in some cases fibrinogen when exogenous estrogens are administered orally.

With Professor Anna Southam, Dr. Turksoy is also studying the effect on subsequent reproductive function of animals whose mothers were treated in pregnancy with synthetic progestones. Some of these compounds have been reported to cause anomalies of the genital tract in human females, and it appears from the rat experiments that even though anomalies are not apparent, the fertility of the offspring of such treated females may be impaired. Also working with Professor Southam, Dr. Shanti Shahani is studying the incidence and significance of antibodies to spermatozoa in relation to human fertility.

Professor Landum B. Shettles has made interesting observations on human spermatozoan populations, with special reference to nuclear morphology. He has observed the ratios of two morphologic types in different individuals with their respective migratory rates through capillary tubes filled with ovulatory cervical secretion.

Physiology and Abnormalities of Pregnancy

Fundamental to the understanding of the maternal-fetal relationship in pregnancy is a knowledge of the function of the placenta and the mechanisms by which essential chemical substances are transmitted across it. Professor Albert A. Plentl has extended his previous work on the metabolism of the respiratory gasses to investigation of the metabolism of urea, using isotopic techniques combined with certain biochemical and physical procedures. Dr. William J. Kelly has been working with Professor Plentl on the mechanism of transmission of other nitrogenous substances, in particular, certain essential amino acids. Work on the problem of placental transmission has also been carried on through experiments combining isotopic tracer

and placental-umbilical cord perfusion methods.

Studies on the metabolism of the placenta by means of Warburg respirometric techniques are being conducted by Professor Emanuel A. Friedman. Attempts are being made to correlate variations in this metabolism with abnormalities in the clinical course of pregnancy and with fetal outcome. Dr. John J. Sciarra is studying the enzyme, leucine amino peptidase, in the placenta and in the maternal serum during normal and abnormal pregnancy. The work is based on biochemical and histochemical techniques, the latter being worked out in collaboration with Dr. Margaret E. Long. Dr. William A. Little has shown that there is an alteration in the lactic dehydrogenase in the maternal serum in the presence of pre-eclampsia and premature separation of the placenta. Dr. Phillips has continued her work on blood coagulation, and the fibrinolytic system in various complications of pregnancy associated with hemorrhage.

The concept of the fetus and its placenta as a homograft in the mother has been under investigation by Dr. Jaroslav F. Hulka, who is working in the laboratories of microbiology under Dr. Samuel M. Beiser, Associate Professor of Microbiology. Professor Gilbert J. Vosburgh has been successful in developing a very sensitive method for the determination of magnesium. He is applying this method to the study of magnesium metabolism in pregnancy and to the problem of placental permeability to magnesium. Dr. Frank Moya, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist, in his capacity as Director of Anesthesia in the Division of Obstetrics has completed a study of liver function in full term pregnancy. He has noted that in eighty per cent of a group of ninety patients there was abnormal bromsulfalein retention prior to anesthesia and that following delivery the function improved regardless of the type of anesthesia.

Labor and Delivery

The graphico-statistical method of labor analysis, originally devised by Professor Friedman, is being applied to the study of several varieties of abnormal labor, with particular reference to etiological agents, and to the effectiveness of several methods of therapy, and to the prognosis

with respect to delivery and fetal result. In association with Dr. Lajos I. von Micsky, technical improvements are being made on the mechanical cervimeter originally devised by Professor Friedman for the objective measurement of cervical dilatation during labor. The development of an instrument of this type is essential if the important phenomenon of cervical dilatation is to be studied.

The acid-base status of mothers during labor and delivery, particularly in relation to analgesia and anesthesia is being examined by Professor Moya and Dr. L. Stanley James, Assistant Professor of Pediatrics assigned to Anesthesiology, in the labor and delivery rooms of the Sloane Hospital. The purpose is to determine whether changes observed in the mother significantly influence the internal environment of the fetus as measured by the fetal electrocardiograph and the biochemical and clinical status of the infant at birth.

The work on milk-ejection in the lactating woman has been extended by Professor Friedman to observation on the direct measurement of intraductile pressure and to the determination of the effect of administered hormones on lactation. A group of studies of the efficacy of sublingual and intranasal preparations of oxytocin on lactation and milk production has been successfully concluded.

Professor Charles M. Steer and Dr. W. Duane Todd have been analyzing the 1,250 breech deliveries conducted from 1948 to 1957. Professor Steer has also been working with Dr. Oscar K. Adamsons on the effect of intravenous magnesium sulfate on the uterine contraction in premature labor. Professor Steer has also reported with Dr. Sciarra a tocodynamometric study of the uterine contractions during labor in a patient with myotonic muscular dystrophy.

The Fetus and the Newborn

The neonatal research unit with Professor James and Dr. Eric D. Burnard, of the Anesthesiology Service, operating on the delivery room floor of the Sloane Hospital, has been very active during the past year, particularly in its study of the effects of the birth process on the biochemical and cardiovascular adjustments of the newborn. The work has been concerned with the

measurement of cardiovascular pressures, a continuation of the radiographic study of the newborn chest to evaluate differences in the size of the heart according to different circumstances of delivery. Cardiac murmurs in the newborn period have been recorded by phonocardiography, and intracardiac recordings have been made with phono catheters. Dr. Jack N. Blechner spent last year as a Josiah Macy Research Fellow assigned to the laboratory of Dr. Donald H. Barren in the Department of Physiology at Yale University. With Professor Barren, he worked on the acid-base balance of fetal sheep and goats using indwelling plastic catheters to obtain blood samples from the umbilical and maternal arteries. During last year he also shared in the comparative study of sodium and potassium concentrations in the maternal and fetal erythrocytes of the goat and the sheep, observations which he proposes to extend to human maternal and fetal red blood cells during the current year at the hospital.

In pursuing his studies on the permeability of the human placenta for the blood group isoantibodies, Dr. Vincent J. Freda has uncovered a new finding which has a direct clinical implication to ABO hemolytic disease of the newborn. The human placenta is more permeable for the beta isoantibody of a subgroup A_2 person than for that of a subgroup A_1 individual. Two principal forms of the blood group isoantibodies do exist, and only one of these readily traverses the placental barrier. More isoantibody will pass the placental barrier when the mother is group O or subgroup A_2 than when she is subgroup A_1 . This finding should explain why mothers who are subgroup A_2 will infrequently produce a child affected with ABO hemolytic disease.

A number of studies are in progress with respect to various types of fetal defects. Dr. Miller has made chromosome analyses on the umbilical cord blood samples of normal infants and one infant suspected of mongolism and found that the latter had forty-seven chromosomes per cell, with the characteristic 21-trisomy found in mongolism. In collaboration with Dr. W. Roy Breg of the Southbury Training School, Southbury, Connecticut, further studies of patients with mongolism have led to the discovery of a translocation involving two of the human chromosomes. Dr. Hulka is studying the role of steroid hormones in the

embryological development of the organs of reproduction by producing antibodies to steroid-protein conjugates in female animals and observing the effects of these antibodies on the anatomy of the offspring of these females. Professor Steer and Dr. Walter Bonney have completed a review of the birth histories of a series of cases of cerebral palsy with respect to the factors of birth injury and anoxia in the production of this defect.

Neoplastic Disease

Study of the radiobiology of cancer of the cervix is progressing under the direction of Professor Saul B. Gusberg, in collaboration with Dr. Grace G. Herman. The cytochemical and morphological response after test doses of radiation has been sufficiently observed so that clinical application of the method and the choice of surgical or radiotherapeutic treatment has become increasingly useful. It is proposed that this program be expanded to include autoradiographic studies and spectrophotometric observations in order to obtain a more quantitative definition of nuclear changes.

The general study of characteristics of neoplastic tissue is being pursued by several collaborating subgroups. This work, in a general way, is concerned with the histochemical, enzymatic, and tissue cultural aspects of gynecologic cancers, but continues to emphasize the special aspects of the different degrees of differentiation for the grades of malignancy manifested by the papillary serous adenocarcinomas of the ovary. In this general field, Dr. Margaret Long is working on the cytochemical localization of certain proteolytic enzymes, and Professor Ines Mandl, in collaboration with Mr. Carlton Blackwood, is studying the proteolytic enzymes of gynecologic tumors on a biochemical basis. Professor Mandl has observed definite correlations between grade of malignancy and the presence of two enzymes, an amino peptidase and a trypsin-like enzyme. The possible relationship of such proteolytic enzymes to the characteristic invasiveness of malignant tumors is obvious.

For the further study of gynecologic cancer, a small tissue culture laboratory has been set up. Using such tissue cultured cells, Dr. Saul Bader has been examining the incorporation of tritiated thymidine by means of autoradiographic studies.

Preliminary studies have indicated the optimum conditions under which such labeled cells may be used for the cytophotometric measurement of mitotic figures for the investigation of some aspects of mitosis.

For the general study of the morphologic and cultural characteristics of human papillary serous cystadenocarcinoma Professor Harold M. M. Tovell has been able to establish permanent cell lines from seven carcinomas of the ovary, or about one-third of those attempted. Morphologic studies of explants of these tumors are in progress. Inoculations have been made into the peritoneal cavity of conditioned rats, both for the purpose of general study, and also for the use of Professor Mandl in her study of proteolytic enzymes.

Blood samples from a series of five patients with gonadal or endometrial cancer and twenty-one patients without cancer cells were cultured and chromosome counts carried out on more than 1,000 cells by Dr. Miller and his assistants. There was found a significant increase in the proportion of cells with more than the modal number of chromosomes. Such heteroploidy may be due to a change in some serum factor or to the presence of viable cancer cells in the blood.

Pursuing still further efforts to develop techniques for the study of human neoplastic tissue, Dr. Hyman Guthwin in the laboratory of the department at the Francis Delafield Hospital, has been working to eliminate factors which complicate cell fraction studies. The special problem of nucleolar isolation from nuclei is in the stage of development of a suitable stain for detecting DNA and RNA changes during the isolation process.

Interesting observations have been made by Dr. Freda on blood group substances and isoantibodies in the ascitic fluid and tissue extracts of metastatic tumors from ten gynecologic cancer patients. Both saline and ethanol extraction methods and the hemagglutination inhibition method were employed to determine the presence of blood group substances. The corresponding blood group of the host was recovered from the tumor implant in each case, and no isoantibody was recovered. The alpha and beta isoantibodies were found in all the samples of ascitic fluid except one, and that person was Group AB. In each case the titer in the ascitic fluid was equivalent

to the titer in the circulating blood serum. The corresponding blood group antigen of the individual was found in the ascitic fluid only when the primary tumor originated from glandular secreting cells of the tumor. By the inhibition method employed, no free group substance was found in the circulating sera, and therefore the titers in the ascitic fluid reflect the amount secreted by the metastatic cells themselves.

In cooperation with Professor Tovell, Dr. Sheldon H. Cherry has studied the influence of estrogens and androgens on the heterologous transplantation of a human endometrial carcinoma. Drs. Todd and Leo Dunn presented before the American College of Obstetricians and Gynecologists an important study of 325 patients on whom a Class III (i.e., "doubtful or suspicious") Papanicolaou smear had been obtained. The study indicated that in recent years fifty per cent of these women were eventually found to have an early carcinoma of the cervix. A review of patients undergoing hysterectomy for intra-epithelial carcinoma of the cervix following a coning biopsy has demonstrated a marked increase in postoperative infections, suggesting the need for local antibiotics when it is intended to follow a coning biopsy with a hysterectomy. Professor Equinn W. Munnell, working with Dr. Bonney has completed a study of 250 cases of recurrent carcinoma of the cervix. The study indicates the poor results that have been obtained in the treatment of such recurrences and suggests a number of important revisions in the principles of therapy. Professor Henry Clay Frick has worked with Dr. John E. Ulmann, Instructor in Medicine, Assistant Physician in Presbyterian Hospital and Associate Visiting Physician at the Delafield Hospital and Drs. Thorpe Kelly and Lowell Hughes. They have been evaluating the use of Cytosan as a chemotherapeutic agent in advanced gynecologic cancer.

Clinical and Miscellaneous Studies

A study of the management of fetal bradycardia over a three-year period has been completed by Professor D. Anthony D'Esopo and Dr. Sciarra. Further studies by Professor Plentl on the use of Sparteine sulfate as an oxytocic agent have confirmed the impression that the drug can be administered with confidence as a

mild stimulant for the induction of labor. The association of hypofibrinogenemia with placenta previa and placenta previa accreta has been reported by Dr. Phillips with Drs. Cherry and Adamsons. Dr. Cherry is working with Dr. Bradley Smith, Visiting Fellow in Anesthesiology, on the correlation of post partum uterine atony, a form of obstetrical anesthesia, which has been administered. Professor Moya has been studying the use of two new agents for the administration of intravenous anesthesia in obstetrics, namely, methohexital and the non-barbiturate G29-505. Professor Moya and Dr. Smith have also been studying the records of 1,500 patients who underwent spinal anesthesia for Cesarean section in order to assess this technique on the maternal cardiovascular system and to correlate any changes noted with the clinical condition of the infant at birth.

In Gynecology, Professor D'Esopo, after a review of the cases of vaginal hysterectomy performed for uterine prolapse, has devised a modification of the technique which he believes has a promise for an obscure cure rate. He has also made a study of the indications for hysterectomy in the presence of the grossly normal uterus. The treatment of erosion of the cervix by enzyme combination of fibrinolysin and desoxyribonuclease has been continued by Drs. Friedman and Little. Dr. Hulka and Dr. George Higgins have completed their study of trauma to the internal cervical os during dilatation and found from a study of hysterectomy specimens that in twenty-two per cent small lateral tears of the internal os were present. Professor William Cavanagh is studying the pattern of controlled and uncontrolled fertility among 500 women seen in the Hygiene Clinic.

Sloane Endocrine Clinic

The Endocrine Clinic directed by Professor Southam provides material for several clinical research projects. During the past twelve months there were 1,337 patient visits to this Clinic, including 234 new registrants.

Various synthetic progesterones are being evaluated for their efficiency in inhibiting ovulation and for their use and treatment of endometriosis and dysmenorrhea. The preconceptional studies on patients with habitual abortions continue,

these women being followed in the Sloane Endocrine Clinic as well as in the Antepartum Clinic, during subsequent pregnancies. Continuing long term follow-up of adolescents with significant menstrual abnormalities is confirming the impression that certain of these women will in later years have definite reproductive problems.

Collaborative Study on Cerebral Palsy

The collaborative study is continuing to gather data in its prospective investigation of preconceptional, conceptional, intrauterine, and parturitional factors involved in the development of neurological disorders of children. The obstetrical unit of the project, which functions under Professor Friedman in his capacity as Obstetrical Coordinator and Assistant Project Director, with the recent addition of Dr. Freda to the staff, continues to operate as a well-disciplined integrated organization.

The annual quota of mothers admitted to the project for intensive investigation has been increased from 500 to 600. Detailed information is being collected regarding genetic, socio-economic and environmental factors, as well as material relevant to previous and concurrent maternal disease, as these might relate to the future growth and development of the offspring. These data, with those accumulated at the other fifteen collaborating institutions, are being processed for analysis by the central project office at the National Institute of Neurological Diseases and Blindness of the United States Public Health Service.

Bulletin of the Sloane Hospital for Women

Under the editorship of Professor D'Esopo and the assistance of Professors Tovell, Robert E. Hall and Friedman, the Bulletin of the Sloane Hospital for Women is entering its seventh year of publication. It continues to be widely read, judging by statements made by several foreign colleagues who have visited the department. The circulation is now about 1,200.

Private funds made available through the Department of Obstetrics and Gynecology and gifts from several pharmaceutical houses make it possible for the publication to continue to meet its expenses. A substantial gift from the Brook Foundation is particularly noteworthy.

Graduate Program in Maternity Nursing

The graduate program in maternity nursing has continued to develop in popularity, applications having tripled in the past five years. A full class of eight students was enrolled in September, 1960.

This program is based on the foundation of instruction in the School of Public Health and Administrative Medicine given in the Autumn semester. These courses are aimed at development of understanding of the community and its health problems, and the introduction to the fundamentals of investigative techniques. In the Spring semester courses offered by the Departments of Nursing and of Obstetrics and Gynecology, by the Maternity Center Association, and by Kings County Hospital, provide opportunity to gain skill and understanding in the clinical field. Since the objective of the whole program is to prepare specialists in the field of maternity nursing and nurse-midwifery, the major emphasis must be put on this kind of clinical opportunity.

Miss Jean Tease has been appointed to the Faculty as Associate in Nursing and will join the program in February, 1961. Miss Tease replaces Miss Anna Mary Noll, who is resigning in order to pursue further study.

Preparation for Childbirth Classes

Under the general direction of Dr. Marion D. Laird, these classes are continuing to be made available on a voluntary basis to patients who wish to attend. Miss Carmela Cavero has been appointed as a new Instructor. From September 1959, through October 1960, 678 individuals have attended these classes. This number includes 248 fathers. There were 3,123 individual patient sessions attended, this figure showing a slight increase over that of 1959.

The Josiah Macy, Jr. Fellowship Program

The fellowship and scholarship programs in obstetrics and gynecology supported by the Josiah Macy, Jr. Foundation remain a most important aspect of the educational and training effort of the department. The scholarships are available to twelve undergraduates each year for two or three months of research, and have enabled the department to introduce students at a fairly early period in their medical school studies to the com-

plex and fascinating problems in the general field of human reproduction. The fellowships are available to medical graduates before, during, or immediately after their clinical residency. They have proved a most effective attraction to men with academic leanings and have made it possible for many to continue their scientific educations for a much longer time than would otherwise have been feasible.

Of the Macy Fellows, there are still twelve in the department who are either currently on a Macy Fellowship or are completing the clinical phase of their work, after having previously served as Macy Fellows. The two Chief Residents, Drs. Little and Adamsons are former Macy Fellows, and each is now assured of a post in a medical school department next year. Other members now on the clinical resident staff who have completed all or a part of their preclinical work are Drs. Donald Christian, Robert Munsick, and Blechner. Assigned to basic science departments are Drs. Sciarra to Anatomy, Hulka to Microbiology, and Nikolas Janovski to Pathology. Working in laboratories of the Department of Obstetrics and Gynecology are Dr. MacDonald, who is working under Professor Lieberman; Dr. William T. Kelly under Professor Plentl; and Dr. Miller and Dr. Wolfgang Tretter in tissue culture and human genetics.

Fellows and Visitors

In addition to the Fellows noted under the Josiah Macy, Jr., Foundation grant, there have been a number of others. Dr. Turksoy, Barnes-Foster Fellow from Turkey, is continuing her work in the laboratory of Dr. Phillips on the fibrinolytic enzyme system. Dr. Shahani, Population Council Fellow from Bombay, is working with Professor Southam on the significance of antibodies to spermatozoa in human infertility, and Dr. Ichiro Taki, of the University of Osaka, Japan, on a China Medical Board Fellowship, is working on gynecologic pathology. Professor Eugenio Lenzi of the University of Ferrara spent three months in the department as a Fulbright Fellow.

Four guest lectures were given in the department during the last year, these being by Dr. F. K. Beller of Tübingen, Germany; Dr. D. J. MacRae of London, England; Joseph T. Velardo

of the Yale University School of Medicine and Claude A. Villee of Harvard University Medical School. There have been some forty-three other visitors from nineteen foreign countries.

Promotions and Resignations

With the beginning of the academic year in July 1960, Dr. Freda, who had just completed his five-year residency, was appointed Instructor in Obstetrics and Gynecology. At the same time, Dr. Tovell and Dr. Hall were appointed to the rank of Assistant Clinical Professor of Obstetrics and Gynecology and Assistant Attending in the Presbyterian Hospital. Dr. David Moore was promoted to the rank of Assistant Clinical Professor of Obstetrics and Gynecology, and Assistant Attending Obstetrician and Gynecologist in the Presbyterian Hospital.

Staff Activities

Among elections to various society membership may be noted Dr. Arnold N. Fenton's to the New York Obstetrical Society; Dr. Christian's to the American Association of Anatomists and Dr. Blechner's to the Yale Chapter of Sigma Xi. Dr. Fenton has also been appointed Director of the Division of Obstetrics and Gynecology at the North Shore Hospital, Manhasset, New York, and is serving on the Long Island Credentials Committee of the American College of Surgeons. Professor Gusberg has been elected Vice-President of the New York Obstetrical Society and is serving as vice-chairman of the Committee on Research in the Treatment of Cancer of the American Cancer Society. He was also chairman of the Conference on Radiotherapeutic Research in the Treatment of Cancer, sponsored by the American Cancer Society at the University of Wisconsin. Several members of the department participated in the Congresses of the American College of Surgeons and the American College of Obstetricians and Gynecologists. Lectures in various parts of the United States were given by Professor Gusberg, Frick, Little, Long, Moore, Munnell, Tillman, D'Esopo and Taylor. Professor Taylor served as Visiting Professor at the University of Melbourne, Australia, presented the Guest Lecture before the Triennial Meeting of the Regional Council of the Royal College of Obstetricians and Gynecologists of Australia.

Professor Plentl spent his six months' sabbatical leave in Europe, chiefly in work on placental transfusion at the Karolinska Institute in Stockholm.

Clinical Report

The work of the Obstetrical Division, as judged by the total deliveries (Table 1), operative deliveries (Table 5) and clinic visits (Table 2) has remained remarkably constant during the last three years. The figure of slightly over 4,000 deliveries annually seems, with current standards, to be about the load that the facilities and the staff should carry.

On the Obstetrical Service, there were four deaths, which under the precise definitions now in force must be classed as maternal. Two of these, however, followed abortion occurring in patients before coming to the hospital, one of these being due to sepsis, the other to an aplastic anemia apparently the result of antibiotic sensitivity. Two patients died after delivery, one from a dissecting aneurysm of the aorta complicating Marfan's syndrome and one from cardiac failure in the presence of pulmonary hypertension due to diffuse pulmonary arteriole sclerosis. There were thus no deaths from strictly obstetrical causes.

The peri-natal mortality, i.e., all stillbirths weighing 500 grams and over and all neonatal deaths occurring in the first twenty-eight weeks, was less than usual. The ward rate of 26.6 per 1,000 live births was about the same as in recent years, but the private and semiprivate rate of 9.5 per 1,000 was spectacularly low (Table 4). The distribution of the peri-natal loss among babies in different weight groups (Table 4) demonstrates again the importance of the problem of premature delivery.

The work in gynecology increased somewhat in the last year. This is shown in an increase of 673 clinic visits (Table 2) and 121 additional gynecologic operations (Table 6). The increase of even six per cent in the total number of operations is perhaps remarkable in view of the fact that beds and operating room facilities are each year considered to be used to full capacity.

The acceptance of a patient with cancer for treatment represents a major responsibility, for variations in the excellence of technique, surgical

or radiological, may well determine success or failure. The "follow-up" of treated cancer patients has become an important function of a medical service for only in this way can therapy be criticized.

Keeping track of patients in a community in which people move frequently and persuading them to return for necessary examinations are not easy. The work of the gynecologic follow-up organization, directed by Professor David B. Moore, as presented in Table 7, represents a considerable accomplishment. The fact that 2,248 cases of gynecologic cancer alone were under observation in 1960 at the Medical Center gives some impression of the scope of work being done in the field of neoplastic disease.

The so-called "five-year results," the listing of patients surviving after this period of observation is shown in Table 7. The record of over fifty per cent of cures in cases of the cervix, the common-

est of the malignant gynecologic tumors, is excellent and an indication of the growing hopefulness with which the cancer patient may undertake her therapy.

Acknowledgments

Special acknowledgment has already been given to the Josiah Macy, Jr., Foundation for its support of the fellowship program. A note has also been made of the support of the Maternity Center Association for the program in graduate teaching in maternity nursing, and of the Brook Foundation for its help in running the Bulletin of the Sloane Hospital. For the support of many research projects, gratitude must also be expressed to the American Cancer Society, the Association for the Aid to Crippled Children, Damon Runyon Memorial Fund, and to the National Institutes of Health.

TABLE 1
VIABLE DELIVERIES

	1947-1956 (average)	1957	1958	1959	1960
Ward	2,298	2,779	3,105	2,936	2,935
Semi-Private	770	829	763	796	727
Private	601	582	598	650	647
Total	3,669	4,190	4,466	4,382	4,309

TABLE 2
CLINIC VISITS

	1956	1957	1958	1959	1960
Obstetrical	25,502	24,781	27,639	25,071	24,610
Gynecological	16,499	16,793	16,888	17,459	18,132
Total	41,001	41,574	44,257	42,530	42,742

TABLE 3
FETAL MORTALITY

	1947-1955 (average)	1957	1958	1959	1960
Ward	30.6/M	27.2/M	25.4/M	30.5/M	26.6/M
Private and Semi-Private	21.8/M	21.2/M	24.9/M	20.8/M	9.5/M

M — per thousand viable births.

TABLE 4
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<i>Weight in Grams</i>	<i>Total Births</i>	<i>Total Stillbirths & Neonatal Deaths</i>	<i>Per Cent Perinatal Mortality</i>
500 - 1,000	35	34	97.0
1,000 - 1,500	30	21	70.0
1,500 - 2,000	68	19	28.0
2,000 - 2,500	283	13	4.6
Over 2,500	3,940	43	1.1

TABLE 5
OPERATIVE DELIVERIES

	<i>Ward</i>	<i>Private & Semi-Private</i>	<i>1959</i>	<i>1960</i>
Cesarean Sections	204	139	348	343
Primary	104	61	173	165
Repeat	100	78	175	178
Mid Forceps	77	45	104	122
Low Forceps	957	512	1,542	1,469
Breech	90	48	137	138

TABLE 6
GYNECOLOGIC OPERATIONS

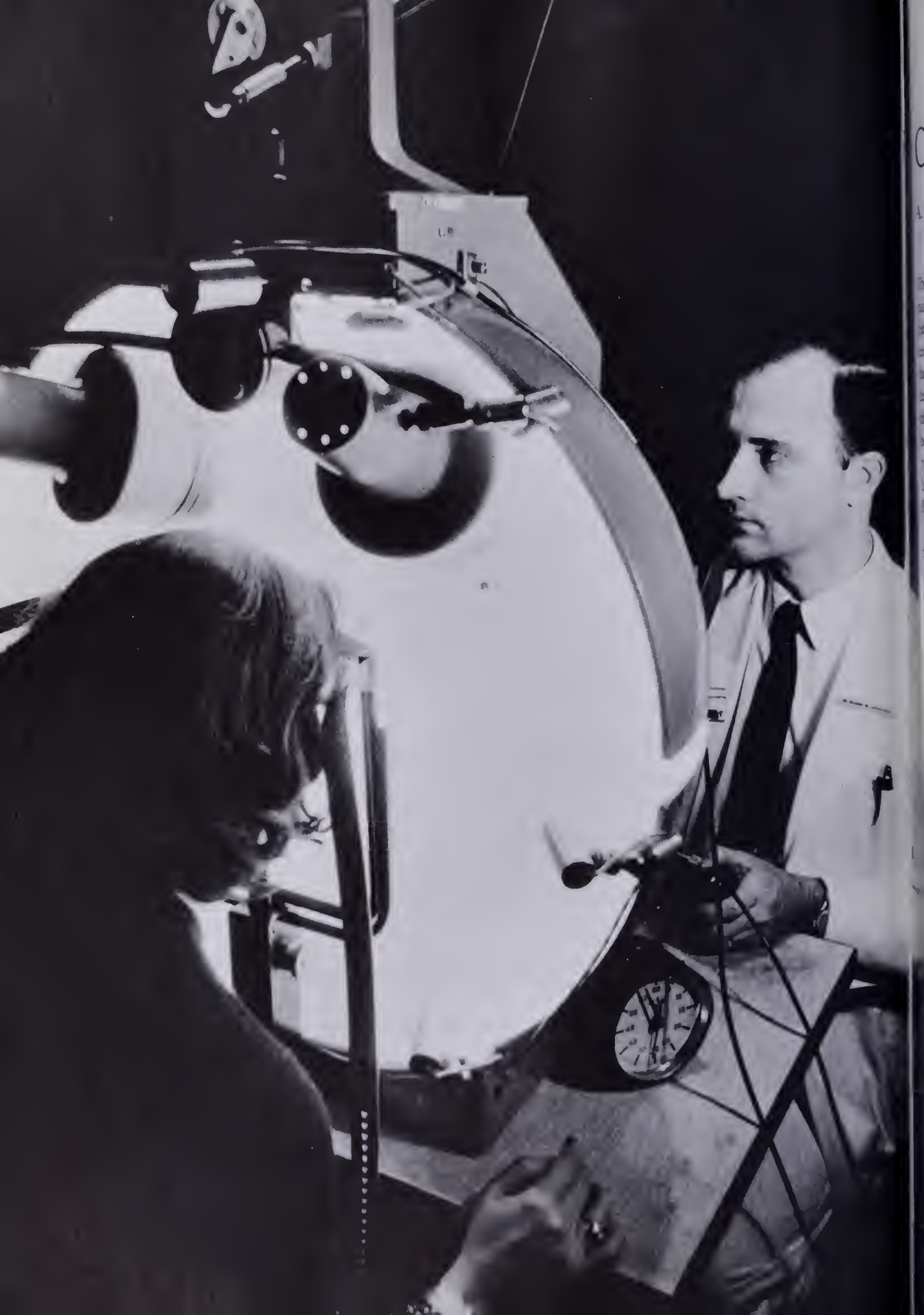
	<i>1947-1956 (average)</i>	<i>1957</i>	<i>1958</i>	<i>1959</i>	<i>1960</i>
Ward	820	919	900	878	977
Semi-Private	334	564	632	606	635
Private	516	419	406	463	456
Total	1,670	1,902	1,938	1,947	2,068

TABLE 7
CASES OF TREATED GYNECOLOGIC CANCER UNDER OBSERVATION
DURING EACH OF YEARS FROM 1955-1960

	<i>Total Patients Followed</i>	<i>The Presbyterian Ward</i>	<i>Private</i>	<i>The Francis Delafield</i>
1955	1,576	748	621	207
1956	1,827	799	643	385
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468

TABLE 8
FIVE-YEAR RESULTS IN PRIMARY CASES OF GYNECOLOGIC CANCER
TREATED AT THE PRESBYTERIAN HOSPITAL, 1952-1954

	<i>1952</i>			<i>1953</i>			<i>1954</i>		
	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>
Cancer of Cervix Uteri									
Totals	40	20	50	43	28	65	38	22	57
Stage I	26	17	65	24	20	83	27	17	63
Stage II	5	2	—	16	8	—	9	4	—
Stage III	6	1	—	1	0	—	1	1	—
Stage IV	3	1	—	2	0	—	1	0	—
Cancer of Corpus Uteri	43	24	55	45	22	49	28	19	67
Cancer of Ovary	26	7	26	15	9	60	24	10	41



Ophthalmology

A. GERARD DEVOE, *Harkness Professor and Chairman of the Department
Director of Service*

The year 1960 has been significant for the Department of Ophthalmology in that physical implementation of plans developed during the preceding year has become apparent. Most notably, the addition of a preliminary year to the residency training for these individuals who show interest and ability in investigative problems has become an actuality. Financial support has been provided by a training grant from the National Institutes of Health of the United States Public Health Service.

Structural changes in the out-patient department of the Vanderbilt Clinic are nearly complete for the new Children's Eye Clinic being developed with funds acquired from the National Council to Combat Blindness. This will be a continuing project under the direction of Dr. Philip Knapp. We believe that by concentrating children with eye diseases in a unit separate from the adult population that more detailed attention can be paid to them under ideal surroundings and with instrumentation designed to facilitate such work. Furthermore, the heavy load currently carried in the adult eye clinic should be handled more effectively.

The second major structural change centers around the electron microscopic unit which has been purchased through the generosity of Mr. and Mrs. Henry J. Gaisman. Two rooms in the research wing of the fifth floor of the Eye Institute has been remodeled to house the new instrument. Dr. Toyoko Ishikawa, trained in Japan under the guidance of Professor Yamada of Kurume University, has arrived and will remain on a fellowship for two years. During this period she will engage in electron microscopic studies of ocular tissues. It seems likely that initially the major part of her efforts will be devoted to establishing the characteristics of normal ocular structures. As yet only a beginning has been made in this field. Following this, and perhaps concomitantly with it, a study of diseased tissues will begin. In all probability this will be a limitless project with

equal probability that the whole subject of ocular pathology will require reinvestigation at the ultra microscopic level.

Departmental Statistics

Most departmental activities continued on a level of the previous year. 3,286 patients were admitted to the hospital for a total of 26,002 patient days. In the Vanderbilt Clinic, 26,377 visits were made by 7,417 out-patients in the Eye Department. Operative procedures numbered 3,059, 2,272 operations being performed by the attending staff and 787 by the resident staff. These figures indicate that there was no significant problem as far as the availability of clinical material for training resident ophthalmologists is concerned.

The John M. Wheeler Library has increased its number of bound volumes to 8,000, and the current journals number 140. Under the direction of Dr. Devorah Khorazo, over 60,000 diagnostic procedures were done in the Microbiology and Clinical Pathology Diagnostic Laboratory of the Eye Institute. In addition, the members of this department have found time to give a basic science course in bacteriology to the resident group, and to continue research activities in staphylococcal phage typing. The Orthoptic Department, headed by Miss Sally Moore, working under the direction of Professor Maynard C. Wheeler and Dr. Knapp, has added Miss Terry Brook to the staff. Two students, Miss Roseleen Gaffney and Miss Ellen Caldwell, have been accepted for training in the department this year. Two hundred and forty-one patients, an average of twenty-five patients per day, were seen at each session of the muscle clinic and 245 new patients were seen in the office in the Eye Institute. It is expected that with the completion of the new Children's Eye Clinic, further expansion will occur in the division of ocular myology.

Mr. Emil G. Bethke, staff artist and ocular prosthetist, has pursued his interests in newer

types of ocular prostheses. Staff photographer and X-ray technician, Mr. James Lafayette, in addition to his usual duties, is developing cinematographic techniques applicable to the eye. Professor Raymond L. Pfeiffer and Dr. Ira S. Jones reported from the X-ray department on 647 patients and the department of pathology, under the direction of Professor Algernon B. Reese, processed 537 specimens, 172 of which were globes, and 367 biopsies.

Professor George K. Smelser has been most active in the development of two training programs both utilizing National Institutes of Health funds to support Fellows. One is designed for the postdoctoral level in which it is hoped to train individuals oriented toward basic research in ophthalmic problems. The other is a predoctoral program made possible by the organization of a subcommittee on medical cell biology. At the present time three students are registered in these programs. Professor Smelser was also the guiding spirit behind the International Symposium on the structure of the eye which was organized and held in the Medical Center in April, 1960. Thirty-six papers which are being published in book form by the Academic Press this year were presented at this symposium. Favorable comment was widespread. It is hoped that similar programs can be arranged in other subjects in future years.

Staff Activities

As in previous years the staff has contributed heavily to the literature, forty-one papers and courses having been given. The geographical extremes this year were Honolulu and Athens. Professor Emeritus John H. Dunnington was the official representative of the American Academy of Ophthalmology and Otolaryngology to the First Congress of the European Society of Ophthalmology Meeting in Athens, in May, 1960. Professor A. Gerard DeVoe has remained a member of the American Board of Ophthalmology, a member of a Special Medical Advisory Group of the Veterans Administration, a member of the Council of the American Ophthalmological Society, has completed his term as a member of the Ophthalmology Training Grants Committee of the National Institutes of Health, and has joined the editorial staff of the Archives of Oph-

thalmology. Professor Reese is currently President of the American Ophthalmological Society and Professor Joseph A. C. Wadsworth is Secretary, not only of this society, but also of the Eye Section of the New York Academy of Medicine. Professor Wheeler is President of the New York Ophthalmological Society. Professor Gordon M. Bruce remains Consultant to the Surgeon General of the United States Navy and has been elected Vice Chairman of the Section of Ophthalmology of the American Medical Association and a member of the Council of the American Ophthalmological Society. Professor Pfeiffer is Associate Editor of the New York Journal of Medicine. Dr. Charles J. Campbell has been reappointed a member of the Armed Forces, National Research Council Committee on Vision. Dr. Andrew de Roeth, Jr. has completed his second year as Associate Editor of the Archives of Ophthalmology, providing an annual review on pharmacology.

Research Activities

Research activities in the department range widely from basic work in cell biology to entirely clinical studies. Professor Smelser, who is directly in charge of research activities, is proceeding with investigation on the "turnover" rate of corneal mucopolysaccharides; a long-term study of exophthalmos; uveal mast cells and their relation to uveal inflammation, and the fate of corneal tissue when grafted.

The Physiological Optics Laboratory, under the direction of Dr. Campbell, has been most active in its program of studying retinal disease. In collaboration with Miss M. Catherine Rittler, Drs. Floyd H. Farrant, Richard Copenhaver, and Walter Griggs, new instrumentation has been developed and work is proceeding on the retinal vascular supply, electroretinography and electromyography. Dr. Max Forbes, a Visiting Fellow from the Department of Ophthalmology of Washington University of St. Louis, is spending a year in the department, primarily studying patients from the Neurological Institute with lesions affecting the visual pathways.

Professor Clifford V. Harding, in association with Mr. Dobli Srinivasan, Mr. Laszlo Bito, Mr. Ronald Maenza, and Dr. Howard Rothstein, has continued studies on the physiology of cell division in ocular tissues, particularly in relation to

the initiation of DNA synthesis and cell division following injury.

In the Laboratory of Microbiology of the Ophthalmology Research Unit, Professor Seymour P. Halbert is carrying out investigations on the cytotoxic effects of rabbit anti-cornea and anti-heart antibodies, the evolutionary significance of lens proteins, and the analysis of human streptococcal infections.

Professor Zacharias Dische's biochemical laboratory has extended its research on the influence of hormonal and environmental factors on the synthesis of albuminoid in the lenses of young rats.

During the first several months of the year, Professor Virginia Weimar remained at Washington University in St. Louis, under the direction of Dr. Oliver H. Lowry, acquiring special training for setting up a laboratory of quantitative ultramicrochemistry. Since that time, she has been active in the construction of the new laboratory and the assembly of special equipment. These new facilities will permit quantitative analyses of such substances as enzymes, RNA, and DNA, down to the single cell level. Professor George Pappas, in addition to his basic work on the fine structure of the amoeba, has collaborated with Dr. Philip W. Brandt on a study of aqueous humor dynamics, with Dr. Anthony Donn and Mr. Gordon I. Kaye, on the fine structure of corneal endothelium and with Dr. Virginia Tenyson, Instructor in Anatomy, on the fine structure of the choroid plexus.

Dr. Otto Lowenstein and Irene Loewenfeld have been studying clinical pupillograms for diagnostic purposes, and are preparing a textbook on the pupil. They are spending major efforts in experimental work concerning the relations between vision and pupillary reactions, simultaneous electroretinograms and pupillograms, genetic and environmental factors in the pupillary reflex pattern, and comparing pupillary reaction pattern with other functions controlled by the autonomic nervous system, such as heart rate, pulse shape, peripheral blood flow and respiration.

In collaboration with Professor Halbert, Dr. Gabriele Ehrlich is continuing to study the effects of anti-cornea and anti-heart serum on cultured cells of the rabbit cornea, and other tissues. She has also been supervising the work of Mr. Munro Levitsky on the morphology of the chromatin of

cultured epithelial, endothelial, and stromal cells for the purpose of learning the fate of these cells following keratoplasty.

Dr. de Roeth has pursued his biochemical studies on diabetic rat retinas. He has demonstrated that diabetic rats pre-treated with insulin no longer have the lower rate of anaerobic glycolysis previously demonstrated in diabetic rats. In addition he has, with Professor Willis S. Knighton, continued the program of evaluation of tonography in the management and prognosis of glaucoma.

Working in collaboration with the Department of Pediatrics, Professor Bruce has continued his research on the ocular aspect of cystic fibrosis of the pancreas.

Dr. Frank D. Carroll has organized a new Optic Nerve Clinic where it is planned to study individuals with diseases of the optic nerve, so that they can be treated more effectively.

Professor George R. Merriam, Jr., in addition to his work in the Radiotherapy Department, with regular follow-up and tumor clinics, has supervised a study of the relative biological effectiveness of various qualities of radiation on the lens.

A study of the ocular manifestations of thyroid disease is being carried on by Dr. Robert M. Day. He has discovered that there may be an exophthalmos inhibiting factor in normal human serum.

Professor Emeritus Dunnington and Dr. Ellen F. Regan have been studying the effect of alphachymotrypsin on lens extraction and the production of filtering cicatrices in monkey eyes. Dr. Donn maintains his interest in the corneal endothelium and has several projects underway concerning transport of fluid and sodium in the cornea. With Professor DeVoe he has set up the Corneal Research Unit, the purpose of which is to coordinate research programs with clinical material.

The Retinal Detachment Unit, under the direction of Professor Graham Clark, is developing new instrumentation, and has been experimenting clinically with the implantation of silicone rubber foam in the treatment of complicated retinal detachments.

The Retinoblastoma Clinic, initiated and directed by Professor Reese, assisted by Dr. Robert M. Ellsworth, has developed an international reputation. In addition to the construction of

careful pedigrees for the analysis of hereditary factors in this disease, this group, in conjunction with the Department of Radiotherapy, has made significant advances in therapy. New positioning devices, high pressure oxygen radiation, and chemotherapeutic techniques are being developed and studied.

The department has been fortunate in having had visitors from numerous institutions, here and abroad, for various periods of time. These include observers from: Argentina, Brazil, Canada, Chile, China, Colombia, East Africa, Egypt, England, Finland, France, Germany, India, Korea, Japan, Peru, Scotland, and Spain. We find these individuals, with their varying backgrounds and points of view, to be most stimulating to our group.

We are again indebted to our many friends for their generous financial contributions. Without them our progress would be considerably slower. Particularly do we wish to express gratitude to

Mrs. Brooks Astor, Henry M. Blackmer Foundation, Mrs. George G. Brewster, Dr. Ramon Castroviejo, Cynamid International, Robert Sterling Clark Foundation, Marie Heye Clemens Fund, Judge Henry J. Friendly, Mr. and Mrs. Henry J. Gaisman, Mr. Edward N. Goldey, Mary W. Harriman Fund, Lillia Babbitt Hyde Foundation, Knights Templar Foundation, Jack Kreindler Foundation, Life Insurance Medical Research Fund, Mortimer and Harriet Marcus Foundation, Dunlevy Milbank Foundation, National Council to Combat Blindness, Inc., National Society for the Prevention of Blindness, New York Foundation, Inc., New York Heart Association, Alfred P. Sloan Foundation, Inc., Snyder Ophthalmic Foundation, Mrs. Lora A. Spanel, The Seeing Eye, Inc., John Hay and Eliza June Watson Foundation, Whitehall Foundation, W. J. Wollman Foundation, and the United States Public Health Service.



Orthopaedic Surgery

FRANK E. STINCHFIELD, *Professor and Chairman of the Department
Director of Service*

The New York Orthopaedic Hospital has endeavored to advance in both the clinical and research fields during the past year.

The semiprivate services have remained at capacity at all times. It has been noted that the ward service has declined somewhat. This decrease may well be explained by the fact that the majority of patients now have insurance of one kind or the other, and are able to afford semiprivate instead of ward service care.

For the year 1960, there were 3,014 patients admitted to the Orthopaedic Service and 2,303 operative procedures were performed. It is the hope and desire of The New York Orthopaedic Hospital and its alumni that some arrangement may be made in the near future by which we may avail our residents of increased training in the surgery of trauma. It is hoped that this may be possible through an affiliation with another hospital.

Our speciality now is progressing in direct proportion to orthopaedic research, and we are very pleased with the research of a fundamental nature emanating from our own laboratories.

Staff Activities

Professor C. Andrew L. Bassett has continued his work with the bone bank. It is now becoming more evident that current research suggests that an acceptable commercial source of banked bone may become available in the not too distant future. Professor Bassett's chief work has been in the factors contributing to osteogenesis in vitro, as well as in the current concepts of bone healing and bone grafting. Together with Dr. James B. Campbell, Associate Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, he has continued his work on Millipore relative to axonal regeneration. Professors Bassett and Campbell received the 1960 United Cerebral Palsy Max Weinstein Award for their outstanding work in this field.

Professor George B. Ambrose has continued

to investigate slipped upper femoral epiphyses, and with Professors Alexander Garcia and Charles S. Neer, II, presented a paper on displaced intracapsular fractures of the neck of the femur at the fall meeting of the American Association for the Surgery of Trauma in California. One of Professor Ambrose's chief contributions to The New York Orthopaedic Hospital has been his advice based on meticulous study and analysis of postoperative wound healing and infection. As a consequence of his diligent work, strict and rigid rules and regulations relative to infections have been established.

Professor Everett C. Bragg, with Dr. Meyer Alpert, Associate in Radiology and Assistant Attending Radiologist, has continued to correlate the findings in discograms, X-rays, and tissue specimens with respect to age and gross extent of degenerative change.

Professor Robert E. Carroll has continued his activities in the orthopaedic hand clinic where 784 patients were seen during the year, 257 of whom received reconstructive surgery. At the present time, a Fellow is assigned to the hand section. In addition, the entire resident staff rotates through this section. It is becoming more and more evident that one of our chief sources of clinical material is in the highly specialized field of hand surgery.

Dr. Irwin Clark, Associate Professor of Biochemistry assigned to Orthopaedic Surgery, has continued his study to determine which moieties of bone are primarily affected by deficiencies or excesses of vitamins A and D. He has also continued long-term studies on the elimination of more radioactive strontium from bone by the parenteral administration of magnesium, and is investigating the effects of vitamin A acid with respect to bone formation and, in particular, with respect to its antagonism to vitamin D.

Professor Frederick S. Craig presented an exhibit on "Congenital plantar flexed talus," at the annual 1960 meeting of the American Medical

Association in Florida, and, at the present time, is doing clinical research on the effect of drug therapy in tuberculosis of bone. During the year, Dr. Craig was appointed Orthopaedic Consultant, First Surgical Division Bellevue Hospital, and Consulting Orthopaedic Surgeon, The House of the Holy Comforter.

Professor J. William Fielding has continued his primary interest in cineradiography, as well as the management of the scoliosis clinic. He was elected Chairman of the Orthopaedic Section of the New York Academy of Medicine this fall, and has been doing outstanding work in this organization. Professor C. Zent Garber has continued to be a tower of strength in the Pathology Laboratory and has maintained clinical orthopaedic pathology at an extremely high level.

Professor Alexander Garcia was elected a member of the American Association for the Surgery of Trauma and Secretary-Treasurer of the New York and Brooklyn Regional Committee of the American College of Surgeons. Together with Drs. Edgar M. Bick, John E. Sullivan, and John J. Bowie, he presented an exhibit on "Multiple Injuries in the Aged," at a number of meetings during the year. Professor Sawnie R. Gaston has continued his work on the clubfoot and is currently summarizing our experiences with talipes equinus varus. At the 1960 annual meeting of the American Association for the Surgery of Trauma, he presented a paper on "Complex Fracture of the Lateral Malleolus," which will be published in the first issue of *The Journal of Trauma*. Professor Halford Hallock has been appointed to the Board of Associate Editors of the *Journal of Bone and Joint Surgery*. He has continued his excellent work as Editor of the *Bulletin of The New York Orthopaedic Hospital* with Professors Bassett, Neer, and Charles T. Ryder, Jr., as Assistant Editors.

Professor D. Keith McElroy continued his study of lumbosacral fusion by the postero-lateral method and is now preparing a paper on the results of this technique. Professor Harrison L. McLaughlin was elected President of the American Association for the Surgery of Trauma and as a member of the Board of Governors of the American College of Surgeons.

Professor Ryder has more and more confined his basic interest to pediatric orthopaedic surgery.

One of his chief contributions has been the work, in conjunction with the Department of Urology, on the functional closure of the bladder in children with exstrophy. The combined approach whereby the orthopaedic surgeon performs the iliac osteotomy, and the genitourinary surgeon repairs the abdominal wall defect has been most satisfactory. Professor Ryder is working on new techniques for hip joint reconstruction in children using both freeze-dried dura and cartilaginous cups. He has also continued his interest in the analysis of the mass of data accumulated relative to hips and legs from the fetal life study.

Professor Frank E. Stinchfield was awarded an honorary Doctor of Science degree by Carleton College.

Professor Melvin B. Watkins continues his interest in the difficult problem of multiple operative procedures on the lower back.

As in other years, a number of our residents have taken an active part in clinical research. Dr. Richard L. Cruess has been most active in reviewing and tabulating the results obtained when a disc is removed without fusion as compared with those removed and followed by fusion. In conjunction with Professor Stinchfield, he presented his work as part of the 1960 American Academy of Orthopaedic Surgeons Instructional Course. Dr. Merle H. Katzman has been active in evaluating the anteversion results in congenital dislocation of the hip and the effect on leg lengths. Currently, he is also doing research with Dr. Theodore R. Waugh on the effect of fibrinolysin on fracture healing. Dr. Waugh has performed clinical research on catheter suction drainage of orthopaedic wounds. This work is scheduled for presentation with Professor Stinchfield at the 1961 meeting of the American Academy of Orthopaedic Surgeons. He is also engaged in evaluating the results of pre- and postoperative correction of scoliosis by the surcingle method. Dr. S. Ashby Grantham was appointed Senior Orthopaedic Resident July 1, 1960. Because of his organizational ability and technical proficiency, the entire department has functioned a great deal more smoothly. Dr. Grantham is preparing a paper of "Failure of Spine Fusions," with Professor Stinchfield which is scheduled for presentation at the January, 1961, meeting of the American Academy of Orthopaedic Surgeons.

The continued loyal support of our teaching program by Dr. Alan DeForest Smith, Professor Emeritus of Orthopaedic Surgery and Consultant Orthopaedic Surgeon, by Dr. William H. von Ackum, and by Professor Barbara B. Stimson, most deeply appreciated.

Drs. Chauncey H. Dobson, Rosamond Kane, John C. McCauley, Jr., and Horace I-Sen Yu continue to be most cooperative and helpful in maintaining the efficiency of our clinics.

Publication of the Bulletin of The New York Orthopaedic Hospital has continued through the year. The annual postgraduate course in orthopaedic surgery was conducted in November, with thirty-seven students from the United States and Canada attending. This course is stimulating, not only to the students, but to the entire staff of the department.

The basic science course for orthopaedic residents is offered twice yearly, and during the past year in an effort to be of aid to hospitals other than this one, we have accepted students from hospitals other than those affiliated with the Columbia-Presbyterian Medical Center.

Our experiment of assigning a single instructor to small groups of third year students has been most satisfactory and rewarding. Under this system we feel that the caliber of teaching has improved tremendously and the students have shown their approval by an ever increasing number of applicants for our residencies.

Staff Changes

Dr. James N. Worcester, Jr., who completed his residency training this year, has been appointed Assistant Attending Orthopaedic Surgeon, and Associate in Orthopaedic Surgery here, and

Visiting Orthopaedic Surgeon, Francis Delafield Hospital, effective January 1, 1961.

The following promotions were effective July 1, 1960: Dr. Bassett from Assistant to Associate Attending Orthopaedic Surgeon; Dr. Carroll from Assistant to Associate Attending Orthopaedic Surgeon and from Assistant to Associate Clinical Professor of Orthopaedic Surgery, and Dr. Fielding from Instructor to Assistant Clinical Professor of Orthopaedic Surgery.

Dr. John D. LeBouvier's resignation as Assistant Attending Orthopaedic Surgeon, Vanderbilt Clinic, was regretfully accepted during the year. Dr. LeBouvier is currently located in Baltimore, Maryland.

Acknowledgments

During the year we have been the recipient of contributions from Mr. and Mrs. J. Spencer Love (through the Burlington Industries Foundation); the Kresge Foundation; Mrs. Bernard E. Smith; Mr. Frank M. Smith; Mr. DeWitt Wallace; Mr. Arthur H. Lamborn; Mrs. Harry W. Bass; Mr. Hobart A. H. Cook; Dr. Franklin Lynch; Mrs. Frances B. Clarke; and Mr. Seymour Milstein. We are extremely grateful for their continued support and trust that the advancement made will show our true appreciation.

The Easter Seal Research Foundation, E. R. Squibb and Sons, the United States Atomic Energy Commission, and the United States Public Health Service have been extremely helpful in supplying sufficient funds to carry out some of our research endeavors.

Our alumni have again remained very loyal and their continued support has been most helpful to us.



Otolaryngology

EDMUND P. FOWLER, JR., *Professor and Chairman of the Department
Director of Service*

During 1960, the increase in the number of female ward patients in otolaryngology was probably due to the high incidence of otosclerosis in females and the growing popularity of stapes mobilization procedures. There has also been an increase in the number of patients treated for Meniere's disease. Here the Presbyterian Hospital continues to pioneer in this country with ultrasonic treatment. The medical and operative treatment of Bell's palsy and the surgical treatment of facial nerve paralysis has increased slightly, as has the vasodilation and anticoagulation treatment for both Bell's palsy and sudden deafness.

The resignation of Professor Herbert S. Friedman after many years of service is reported with regret. The number of active Attendings in otolaryngology has fallen from thirty-three in 1945, to thirteen in 1960. During these years, there has been a marked increase in the number of patients seen in the adult service with the same number of beds. Antibiotic therapy decreases the length of hospital confinement, and this makes for a more rapid turnover. In Babies Hospital, myringotomies and simple mastoidectomies are being performed in greater numbers because of the increasing incidence of non-suppurative otitis media and mastoiditis.

Professor Franz Altmann has continued his researches on stapes mobilization and on microscopic structure of the human stapes. He has also continued his clinical work on ultrasound in the treatment of Meniere's disease. He was a member of the organizing committee of the International Symposium on Otosclerosis at the Henry Ford Hospital in Detroit in November, 1960, where he read papers on these subjects.

Professor Daniel C. Baker, Jr. started investigation of intranasal injections of corticosteroids for allergic and vasomotor rhinitis with Dr. Ernest Kopstein. He has done a series of cases on the transantral-ethmo-sphenoid approach to the pituitary for inoperable cancer of the breast in con-

junction with Dr. Thomas Bridges, Associate in Neurological Surgery and Associate Attending Neurological Surgeon. He has been elected to membership in the American Board of Otolaryngology; elected Secretary to the American Bronchoesophagological Association and elected to membership in the American Society for Head and Neck Surgery. The physiology and pathology of the esophagus is being studied in light of newer developments. Selected patients are esophagoscoped in the Gastro-enterology Clinic so that there is a correlation of this diagnostic study with other studies.

Professor Milos Basck assisted Professor Altmann in studies of otosclerosis, as mentioned above, and Dr. Bela Marquit with studies of homographs of the middle ear. In addition, he has continued his investigations of the anomalies of the facial nerve in normal temporal bones, and on the measurement of output and effect of ultrasonic transducers as used on the labyrinth.

Professor John Conley's research activities encompass swallowing function following radical surgery of the head and neck and the investigation into statistical data on sarcomas, melanomas, and neurogenous tumors of the head and neck. In addition, he read one or more papers on head and neck surgery, including multiple graft facial nerve repair, before general and specialized groups in San Juan, New Orleans, Miami, Philadelphia, West Virginia, Atlantic City, Chicago, and Detroit. He was also appointed to the editorial board of the Archives of Otolaryngology.

Dr. Thomas H. Fay, Jr. has continued his study of the rehabilitation of children with hearing impairments, and procedures of speech audiometry and hearing evaluations, as well as classifying the diagnoses of various types of hearing impairment in the Speech and Hearing Clinic, also with the delayed auditory feedback study started by Richard A. Chase (P&S '60).

Professor Edmund P. Fowler, Jr. has continued his research on the effect of infection and anti-

inflammatory agents, such as heparin and anti-serotonins, on small blood vessel circulation. He believes that intravenule phenomena, the first to be seen as a tissue reaction, are probably the most important phenomena in the development of many symptoms and disease processes. He lectured on intravenule effects before the combined Columbia-Presbyterian Medical Center alumni group in April, 1960, before the Collegium Otolaryngologicum in Padua, Italy, and also before the students and staffs of the Department of Otolaryngology in Stockholm, Copenhagen, Bristol, and in Oxford. A paper on surgery and anamalous courses of the facial nerve was given by invitation at the Southwest German Otological Society in Hamburg/Saar. A discussion of the clinical experience necessary for residents in otolaryngology was delivered before the teacher's section of the American Academy of Ophthalmology and Otolaryngology. Professor Fowler was Chairman on the Section of Otolaryngology of the New York Academy of Medicine. With Dr. Fay, he has been working on the causes of hearing loss in the Medical Center population, and with Mrs. Shulamith Kastein on dysacusis in children.

Dr. Robert M. Hui was consultant to the Board of Education for otolaryngological problems. He has worked on improved methods of screening of hearing of school children and the evaluation of audiometers and new ear phones. He also worked on the evaluation and treatment of hearing losses in a geriatric population in City housing projects, and acted as consultant to the Bureau of Handicapped Children evaluating the speech and hearing centers in New York City.

Mrs. Kastein continued her collaborative study of dysacusis children at the St. Joseph's School for the Deaf. She was made consultant to the project on perinatal research at the National Institute of Neurological Diseases and Blindness. The following subjects have been presented: differential diagnosis of children with communication disorders at Pennsylvania State University and at the Massachusetts Speech and Hearing Society in Boston; on the brain injured child, differential diagnosis through language evaluation with a discussion of clinical cases and longitudinal

studies of children with communication disorders and central nervous system impairments at the Northwest Summer Conference on the Special Child in Seattle and at the Annual Convention of the American Speech and Hearing Association in Los Angeles.

Dr. Marquit, working with Dr. George Harrison, completed a project on a new method of utilizing homografts in reconstructive surgery, particularly in the nose and larynx. He has started a new project with Professor Basek on utilizing homogenous bone and cartilage in middle ear surgery.

Professor Jules Waltner has been working on carinal biopsy in carcinoma of the lung and posterior choanal atresia, the role of antibiotics in otolaryngology, and long term therapeutic results of nonchromaffin paraganglioma.

Dr. Stanley Whitfield continued his duties as administrator of the training program for residents and has started a pilot study of the disruption of the blood supply to one-half of the head of amblystoma embryos with hopes of producing congenital anomalies.

Professor De Graaf Woodman was on a panel discussing bilateral abductor paralysis at the American College of Surgeons meeting in Boston. He continued his clinical research on glottic obstruction. He was made President of the New York Bronchoscopic Society.

Financial assistance for the various projects in the department is gratefully acknowledged to The Deafness Research Foundation, The Research Council of the American Otological Society, The Philip Hanson Hiss, Jr., Memorial Fund, The Gelb Foundation, the Abbott Laboratories and the United States Public Health Service.

During 1960 7,752 patients of which 2,165 were new patients were treated in Vanderbilt Clinic. There were 1,680 admissions to Presbyterian Hospital and 206 to Harkness Pavilion with a total of 1,136 operations. There were 1,168 admissions to the Babics Hospital and 926 operations. There were 829 consultations on the other services of the Presbyterian Hospital.



Pathology

DONALD G. MCKAY, *Delafield Professor and Chairman of the Department*
Director of Service

The opportunity of serving the Columbia University College of Physicians and Surgeons and The Presbyterian Hospital as Chairman of the Department of Pathology and Director of the Service is a heartfelt privilege.

The present Department of Pathology may justifiably be compared to an embryo. One of the fundamental facts of embryonic life has been stated by Dr. George Streeter of the Carnegie Institute of Washington; "... thinking of the embryo as a living organism which in its time takes on many guises, always progressing from the smaller and simpler to the larger and more complex . . . It is to be remembered that it is by means of their structural organization that embryos are able to carry on as living organisms, for embryos not only develop but they must also live. The requisite functions are carried on during alterations."

This, then, is our position, namely to carry on the requisite functions while we improve in both structure and function.

Staff and Organization

The staff and organization of the department in many respects are new. In the belief that one Department of Pathology can better serve the needs of the patient, the education of residents, and the teaching of medical students, the department has been organized on a unified basis. In this reorganization every effort has been made to preserve those individual features of the divisions of surgical, pediatric, and neurological pathology that have resulted in world wide recognition of their achievements. These divisions, headed by Professors Raffaele Lattes, Dorothy Andersen, and Abner Wolf, are cornerstones in the foundation of our new department.

Several pathologists who are new to Columbia have joined us and now constitute the nucleus of the general pathology service. Dr. David Spiro, of the Harvard Medical School and the Massachusetts General Hospital, is Associate Professor

of Pathology and Associate Attending Physician. Dr. Alvin Volkman, of the Harvard Medical School and the Peter Bent Brigham Hospital, is Assistant Professor of Pathology. Dr. Joseph Wiener, of the Mallory Institute of Pathology, and Dr. Morton Pachter, of the Cancer Memorial Hospital, are Associates in Pathology. Dr. John Gorman has joined our staff as Associate in Pathology and Assistant Director of the Blood Bank.

We are fortunate in having the help of many outstanding pathologists in our affiliated hospitals. One of the changes in our department has been to bring these men closer to our students and residents so that we may have the benefit of their expert knowledge by way of lectures and laboratory teaching. We are particularly grateful for the advice and help of Professor Harry Zimmerman, Professor Hans Popper, and Professor Emeritus Arthur Purdy Stout who have given generously of their time and experience in planning for the future. In addition, the following pathologists contribute importantly to the teaching of our medical and dental students: Dr. Lucretia Allen, Dr. Irwin Alemnoff, Professor A. Azar, Professor Charles Begg, Professor Daniel Benninghoff, Dr. Monroe Birns, Dr. Melvin N. Blake, Professor Donald E. Brown, Professor Lester R. Cahn, Professor Rudolf Garret, Professor Robert L. Hirsch, Professor Rene Jahiel, Professor Austin D. Johnston, Dr. Paul Klempner, Dr. Donald MacPherson, Dr. Artemis Nash, Professor Stanley R. Opler, Professor Theodore H. Spaet, Professor Lotte Strauss, Professor John Tullis, and Dr. Marianne Wolff.

Research Activities

Professor Andersen has continued her studies on cystic fibrosis and celiac disease in children, with the assistance of Drs. Carolyn Denning and Herbert Cohen, both Instructors in Pediatrics and Assistant Pediatricians. Professor Andersen received an award and plaque from the National

Cystic Fibrosis Research Foundation for her work on this disease.

Professor William A. Blanc is Assistant Project Director for Pathology of the Child Development Program. He has made several contributions in the field of diseases of the stillborn and newborn infant.

Professor Lattes has completed a study of regional enteritis demonstrating the value of the microscopic features of this disease in predicting its eventual outcome.

Professor Nathan Lane has completed a study of the uterine cervix which adds important information about the early stages of tumor development in one of our most frequent cancers. Professor Lane is currently investigating several aspects of cancer of the breast.

Professor Luciano Ozzello has completed a study of the effects of acid mucopolysaccharides on the growth of breast cancer cells in tissue culture. Professor Ozzello is continuing this study and also the invasion of connective tissue cells by human breast cancer cells in tissue culture.

Dr. Hans Kaunitz, in conjunction with Dr. Charles Slanetz, Curator of Animal Husbandry, has continued his studies of lipid metabolism. The nutritional effects of some of the substances developed during the oxidation of fats have been studied because it seems possible that some of these substances (cleavage products, peroxides, or polymers) may have specific pharmacologic actions. Dr. Kaunitz, with Dr. Robert Rugh, Associate Professor of Radiology, is also studying the possible protective influences of fat polymers in the diet on irradiation of the animal body.

Professor Henry S. Simms and Dr. Benjamin N. Berg have continued their studies on longevity and aging. They have found that lifespan can be lengthened by restricting the food intake of rats under standard conditions because this dietary restriction delays the onset of lesions of all the major diseases. Dr. Berg, in collaboration with Professor Wolf, is studying changes in the nervous system of aging rats.

Dr. Pachter is continuing his research on the effect of macromolecules on the cellular response to inflammation. Dr. Wiener, in collaboration with Professor Spiro, is beginning an electron microscope study of experimental thrombosis. Professor Volkman is engaged in a histochemical

study of the response of vascular endothelium to a variety of noxious stimuli. Dr. Gorman is continuing his studies of biochemical defects in the red blood cells of certain patients with anemia and is beginning a basic study of the nature of antibody formation.

Professor Donald G. McKay is continuing his studies of the effects of bacterial endotoxins on the vascular system. Professor Spiro is engaged in the establishment of an electron microscope laboratory around which much of the future of the department will be oriented.

At the Delafield Hospital, Professor Edith Sproul has directed the activities of a large and busy Pathology Service. In spite of the many administrative demands on her time, she has also conducted several research projects including a study of exfoliated tumor cells in the sputum of patients with carcinoma of the lung and one of the effects of radiation on the cells of the respiratory tract exfoliated into the bronchial secretions. In addition, Professor Sproul has collaborated with Professor Emeritus Stout on a study of the effects of chemotherapeutic agents on prostatic carcinoma. This work is part of a national survey.

Dr. Silvio Fiala has continued his studies of nucleotide metabolism in the adrenal cortex.

Professor Emeritus Stout is continuing an extensive study of mesenchymal tumors in children including lipoblastic tumors, hemangiopericytomas, fibrous xanthomas, histiocytomas, synovial sarcomas, Kaposi sarcomas, myxomas, malignant mesenchymomas, and glomus tumors.

Under the sponsorship of the National Institute of Neurological Diseases and Blindness of the National Institutes of Health, Professor Wolf has developed an outstanding program for training neuropathologists. Many of the graduates of this program have gone to teaching and research positions.

Many aspects of research on neurological disorders are being prosecuted under Professor Wolf's direction. Dr. Emanuel M. Stadlan and Dr. Murray Bornstein have begun a study of experimental allergic encephalitis and neuritis. Dr. Elliott Marcus, in collaboration with Dr. Dominick Purpura, Associate Professor of Neurological Surgery, is studying the effects of steroids on the electrical activity and histology of the brain. Dr. William McCormick has started a study of

renatal infection of the central nervous system. Professor Sheila Donahue is studying the central nervous system by use of the electron microscope. In this work, she has had the generous cooperation of Dr. George D. Pappas, Assistant Professor of Anatomy. Professor David Cowen and Dr. Lester Geller are studying the long term effects of prenatal exposure to x-radiation on the central nervous system of the rat. The work in this department has received the generous support of the Association for the Aid of Crippled Children, the Matheson Commission, the United Cerebral Palsy Association, and the United States Public Health Service.

The Future

Although the purpose of an annual report is to take a backward glance, it is quite clear that the forward glance of this department is of greater significance. In order to contribute our share to the development of new medical knowledge

and so that the department may compare favorably with those of other schools throughout the country, several large tasks lie ahead. Research laboratories must be established and teaching facilities must be brought up to date. A beginning in this direction has been taken in the establishment of an electron microscope laboratory under the direction of Professor Spiro.

One of the major functions of this department is to train residents in pathology. Starting in July, 1961, a residency program involving training in all aspects of pathology will be instituted. This has been made possible by the addition of five assistant residency positions.

It will always be our aim to provide increasingly improving service to the clinicians of the Hospital and the other departments of the Medical School. Hopefully then, the embryonic Department of Pathology will mature and attempt to approach the stature of the other outstanding departments of this Medical School.



Pediatrics

EDWARD C. CURNEN, JR., *Carpentier Professor and Chairman of the Department
Director of Service*

The year 1960 was a period of transition for Pediatrics at the Columbia-Presbyterian Medical Center. As the time approached for Professor Rustin McIntosh's retirement, the writer was appointed as his successor. With the exception of resignations and retirements reported below, there were relatively few changes in the staff. An attempt has been made to maintain the previous high level of teaching, research and clinical activities in spite of the serious handicap imposed by deficiencies of space. The need for improved and additional accommodations was paramount among the formidable problems awaiting solution. Early and accurate definition of these problems and resolute efforts to solve them by orderly and appropriate action appeared to be urgent requirements. To achieve these objectives without sacrificing the high standards of education and service developed in the past is a present challenge and responsibility.

Changes in Staff

On June 30, Professor McIntosh retired after almost thirty years of devoted and distinguished service as Carpentier Professor of Pediatrics in the medical school and as Director and Attending Pediatrician of the Pediatric Service in the hospital. During this time, Professor McIntosh's name became almost synonymous with pediatrics and his reputation as an astute clinician, wise educator and inspiring leader was known throughout the world. As an expression of affection and esteem, members of his staff and former colleagues gathered last spring to pay their respects and presented to him a commemorative volume entitled "The McIntosh Era at Babies Hospital, 1931-1960." This work, which has since been published, contains a selected collection of notable scientific contributions in the field of pediatrics made by present and former members of his staff. The personal and professional characteristics of Professor McIntosh, which won the respect, admiration and loyalty of students and col-

leagues in successive generations, are revealed in commentaries which introduce the reprinted papers. The wider recognition of Professor McIntosh's own contributions to pediatrics is evident in his selection by the American Pediatric Society, of which he is a past president, to be the recipient at the annual meeting in 1961 of their highest honor and award, The Howland Medal.

Fortunately, Professor McIntosh's transition from active to emeritus status has not meant departure from the hospital nor abandonment of previous interests. He is presently preparing another revision of the textbook of pediatrics which bears his name and, as a special consultant to the New York City Department of Health, is engaged in an exploration of city medical services related to maternal, child and school health. It is hoped and expected that he will also maintain active association with the Department of Pediatrics and the Babies Hospital and continue to participate personally in their educational programs.

Dr. Howard H. Mason, Consultant to the Pediatric Service and former Clinical Professor of Pediatrics, died on May 8, 1960 in his eighty-second year. Professor Mason was born September 26, 1878 at Providence, Rhode Island. His long association with the College of Physicians & Surgeons began soon after the turn of the century when he entered this medical school from which he graduated in 1904. Following training on the medical service of the Presbyterian Hospital, and at the Sloane Hospital for Women and an apprenticeship with Dr. L. Emmett Holt he was appointed in 1913 Assistant Visiting Physician to the children's division of Presbyterian Hospital. In 1930 he joined the attending staff of the Pediatric Service at the Medical Center and began an appointment as Clinical Professor of Diseases of Children which continued until 1948 when he was designated Consultant to Presbyterian Hospital. Professor Mason has been characterized as diffident but skillful in teaching, productive in research and, in clinical work, "a doc-

tor's doctor," respected by his colleagues especially for his perception and judgment. His warmth, generosity and keen sense of humor were personal attributes appreciated by all who knew him.

Dr. Beverly C. Morgan, Assistant in Pediatrics and Assistant Pediatrician, resigned to accept the position as Director of The Heart Station at the Robert B. Green Memorial Hospital, San Antonio, Texas. Dr. Lilian A. Boker, Associate in Pediatrics and Assistant Attending Pediatrician, resigned after thirteen years of faithful and valuable service in the Allergy Clinic in order to devote more time to her family. Dr. Avron Y. Sweet, Instructor at Mount Sinai Hospital, resigned to accept a position as Assistant Professor of Pediatrics at Western Reserve University School of Medicine, Cleveland, Ohio. Dr. Virginia N. Wilking, Associate in Psychiatry and Assistant Pediatrician, resigned in October in order to accept an appointment as Professor of Psychiatry and Chief of the Division of Child Psychiatry at Seton Hall College of Medicine, Jersey City, New Jersey. Dr. Oscar L. Frick, Assistant in Pediatrics and Assistant Pediatrician, resigned in November. He plans to continue studies abroad. Professor Charles D. May resigned in December to accept a full time position as Professor of Pediatrics at the New York University Medical School. Gratitude for the loyal services of all these former members of the staff is hereby expressed together with best wishes in their new undertakings.

Upon his retirement Professor McIntosh was appointed Professor Emeritus and Consultant to the Pediatric Service; Professor Edward C. Curren, Jr. was appointed his successor as Carpenter Professor of Pediatrics, Chairman of the Department, and Attending Pediatrician and Director of the Pediatric Service. Dr. Arnold P. Gold and Dr. Marvin M. Siegler were appointed Assistants in Pediatrics, the latter also was appointed Assistant Pediatrician on the Pediatric Service. New appointments as Fellows were given to Dr. Michael Katz and Dr. Hyman Gelbard in the Child Development Program, Dr. Michael Katzenstein and Dr. Barbara Williams in the fetal life study, Dr. Elaine F. Vorhaus and Dr. Paul K. Mooring in cardiology and Dr. Marilyn Schotland in endocrinology. Appointments as Assist-

ant Pediatricians in the Vanderbilt Clinic were given to Drs. John G. Bell, Jr., Bernhardt W. Hausheer, Nicholas F. Pizzolato, Alvin Shulklapper, and Martin B. Vita.

Dr. Sidney Blumenthal was promoted from Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician to Professor of Clinical Pediatrics and Attending Pediatrician. Drs. Herbert I. Cohen, Carolyn R. Denning and Robert B. Mellins were promoted from Assistant to Instructor in Pediatrics. Dr. Marguerite J. Gates, Director of the Child Development Program, was promoted from Assistant in Pediatrics and Assistant Pediatrician to Instructor in Pediatrics and Assistant Attending Pediatrician.

Patient Care

The total number of patients admitted to the hospital was 5,258, which represents 59,990 patient days care. This has resulted in eighty-four per cent bed occupancy, the highest rate in over seventeen years. The number of patient visits made during the year in the Out-patient Department totaled 45,420, of which 6,626 visits were made by new patients. In the private offices of Babies Hospital there were 18,033 patient visits.

A number of changes in the care of patients evolved during 1960. Reallocation of graduate nurses in order to improve twenty-four hour coverage on each of the floors of Babies Hospital resulted in more satisfactory handling of patients. The special nursing care units, which give expert attention to the very sick child, were in constant use and demonstrated again the value of this type of service to the patients. All patient units in the hospital were provided with new beds, cribs, chairs and bedside tables. A team of nurses was specially trained and proved to be most valuable in the complicated post-operative care of children following open-heart surgery. As in previous years patients benefited from the immeasurable assistance given by volunteers and "Candy-stripers" who helped with nursing care, feeding, bathing and entertainment.

Research

Professor Hattie E. Alexander and her associates have continued fundamental studies in microbiology and have made further contributions of consequence. With Dr. Katherine Sprunt,

she is engaged in an exploration of the role of viruses on response of patients to bacterial infections. One phase of this program, a study of the nature of the staphylococcus problem in newborn has yielded basic information which is important and provocative. With Professor Douglas S. Damrosch and Dr. Herman Grossman, Professor Alexander is also pursuing an investigation of factors determining host reaction to tubercle bacilli. In a major investigation on the control of heritable traits of microorganisms Professor Alexander has been assisted by Miss Grace Leidy. The nature of the process which changes genetic traits of bacteria through exposure to deoxyribonucleic acid (DNA) of related but different species has been under study for several years. The principles which have been found to govern this process are being explored for their possible application to mammalian cells. Mechanisms of control of inheritance in enteroviruses are being investigated by Professor Alexander and Dr. Sprunt. In 1958 Professor Alexander and her collaborators, Drs. Gebhard Koch and Isabel Morgan Mountain, demonstrated that poliovirus infection of human cells in tissue culture is in essence an invasion by free ribonucleic acid (RNA). This observation has provided an important tool for further studies. Free RNA invades the cells under appropriate conditions and directs them not only to replicate the highly specific RNA but also a new and highly specific protein required to make intact virus. The specificity of the free RNA of types I and II polioviruses, types 1 and 8 ECHO viruses and types A7, B4 and B5 Cocksackie viruses suggests that the same RNA functions both as a virus and a determinant of heredity. Investigations by Dr. Sprunt and Professor Alexander on factors which determine infectivity of free RNA in human cells in tissue culture have also yielded important basic information.

Professor Dorothy H. Andersen has continued to be responsible for research in cystic fibrosis and celiac disease, assisted by Drs. Denning and Cohen. Investigations currently in progress include studies of cardiopulmonary function, pigmentation of teeth, peptic ulcer and ocular changes which occur in cystic fibrosis. Professor William A. Blanc has been the responsible pathologist in the Child Development Program. In

addition he has participated in studies of the placenta and of infection in the newborn and has evinced interest in the pathology of the testis especially in cases with anomalies of sex chromosomes.

Professor Ruth C. Harris has undertaken studies in premature infants of bilirubinemia and associated blood values. This work is being conducted in collaboration with Professor Gilbert W. Mellin, Dr. Katzenstein, Professor James A. Wolff and Dr. Paul A. Marks, Assistant Professor of Medicine and Assistant Physician. Professor Harris has also conducted an investigation of the dye-binding capacity of serum in relation to the associated levels of protein and bilirubin. In the course of studies on glycogen storage disease Dr. Harris found that four patients with glucose-6-phosphatase deficiencies had elevations of serum calcium. Dr. Robert A. Fishman, Assistant Professor of Neurology and Assistant Attending Neurologist, studied the same specimens of serum and found that the magnesium values were also elevated. Currently the influence of Vitamin D upon these findings is being evaluated and the effect of giving these patients sodium in excess of their requirements is under study. During the year the Menghini needle has been used as a means of obtaining biopsies of the liver from infants and small children. As a result of attempts in twenty-one such patients, tissue was obtained from all but two. This tissue was used for histologic examination, determinations of glycogen content and enzyme activity and for attempted recovery of virus. The successful application of this technique provided valuable information about parenchymal disease of the liver and the course of hepatic disorders in infants and young children. Professor Harris has continued studies of aminoaciduria utilizing paper chromatography as a screening tool to help in the diagnosis of neurological disorders as well as of hepatic and renal diseases. Metachromatic techniques of staining urine have been employed in efforts to provide aids in the diagnosis of mucopolysaccharide disorders. In relation to studies of obstructive jaundice triparanol (MER/29) has been used in attempts to reduce serum cholesterol. The impressive relief from itching obtained in one patient has encouraged further observations. During the first three months of 1960, prior to his

return to Israel, Dr. Solomon H. Blondheim continued a study of the effects of artificial light on bilirubin. He found that exposure of serum to light *in vitro* caused diffusion of a small amount of free bilirubin from the serum as measured by dialysis and spectro-photometric analysis. This diffusion was not observed *in vivo* when patients with hyperbilirubinemia were exposed to a similar light for comparable periods.

The research activities of Professor Melvin M. Grumbach and his associates have been focused on several different aspects of pediatric endocrinology and metabolism. With Dr. Akira Morishima, methods were adapted for the analysis of human chromosomes in cells cultured *in vitro*, especially leucocytes and specimens of skin obtained by biopsy. Studies of the chromosome constitution in a variety of sexual anomalies have brought to light several new chromosomal aberrations including XXY sex chromosome complex in individuals with duplicate sex chromatin masses and examples of sex chromosome mosaicism including XX/XX/XO, XXX/XO and XX/XO. In four true hermaphrodites a sex chromosome anomaly was not detected. Of especial interest has been the evidence obtained in their laboratory which strongly suggests that the sex chromatin mass, a characteristic of female-type nuclei, arises from the heteropyknotic region of a single X chromosome and not from two X chromosomes as has previously been supposed. A new hypothesis of sex chromatin was formulated which suggests that there are morphological and functional differences between the two homologous X-chromosomes of the female. Studies are also in progress to detect chromosomal aberrations in association with various congenital anomalies.

The effects of androgens and certain oral progestins with androgenic activity on the human female fetus were analyzed by Professor Grumbach. It was found that fusion of the labioscrotal folds and a urogenital sinus were present at birth only in instances in which the female fetus was exposed to these substances prior to the thirteenth week of gestation, whereas clitoral enlargement may occur at any time after the first six weeks of fetal life.

In collaboration with Professor Blanc, the histopathology of gonadal anomalies was studied in

detail by Professors Grumbach and Blanc. Evidence was obtained which indicated that the testicular defect in seminiferous tubule dysgenesis (Klinefelter's syndrome) need not be present at birth or in early life.

With Dr. Selma L. Kaplan, Professor Grumbach has studied the specificity of rabbit antisera to human growth hormone and the antigenic homogeneity of human growth hormone. The hemagglutination-inhibition assay for human growth hormone described by Read was improved. A method for treating sheep red cells with formalin was adapted; this considerably simplified the assay procedure and improved the reproducibility of the assay. Studies designed to indicate the distribution of growth hormone in cells of human pituitary glands were carried out in collaboration with Dr. Beatrice C. Seegal, Professor of Microbiology, using a fluorescein-tagged gamma globulin fraction of rabbit antiserum to human growth hormone. Evidence for the localization of the fluorescein-labelled antibody in the eosinophilic cells of the human pituitary was obtained. Studies of the localization of the fluorescein-labeled antibody in the pituitary glands of children of various ages and adults are in progress. In studies to determine the characteristics of human growth hormone in plasma using I^{131} labelled human growth hormone, evidence was obtained by radioimmuno-electrophoresis and paper electrophoresis which suggests that human growth hormone migrates in the region between the serum beta and gamma globulins and does not appear to be bound to a specific plasma protein.

Professor Grumbach, in collaboration with Dr. Kaplan found that isoleucine and its alpha-keto analogue, alpha-ketoisocaproic acid induce hypoglycemia in the leucine-sensitive form of infantile hypoglycemia. It was shown that these substances induced in sensitive individuals an increase in the concentration of plasma insulin by a direct action on the mechanism of insulin secretion from the beta cells of the pancreas. These findings afford an explanation for the mechanism of hypoglycemia in persons with this disorder. With Drs. Kaplan and Schotland, Professor Grumbach studied the effects of a standard intravenous injection of tolbutamide, a sulfonylurea derivative which stimulates insulin secretion is being studied

in normal subjects and children with hypoglycemia. It has been found that subjects with the leucine-induced form of idiopathic hypoglycemia are not hyperresponsive to tolbutamide, an observation which suggests that leucine and tolbutamide may affect the release of insulin from the beta cells through different mechanisms.

In long-term studies of the metabolism and excretion of 17-ketosteroids and corticoids in infants and children it has been shown by Professor Grumbach that the metabolism of corticoids in premature infants differs qualitatively as well as quantitatively from that in older children and adults, reflecting mainly differences in the handling of these substances by the liver. In collaboration with Dr. Seymour Lieberman, Associate Professor of Biochemistry, and Dr. Raymond L. Vande Wiele, Assistant Professor of Obstetrics & Gynecology and Assistant Obstetrician and Gynecologist, the secretory rate of a variety of C_{19} and C_{21} steroids has been determined by Professor Grumbach in patients with congenital virilizing adrenal hyperplasia.

The Department of Pediatrics represented by Professor Wolff and Dr. Anneliese L. Sitarz has continued to participate in the work of the Leukemia Chemotherapy Cooperative Study Group A under the auspices of the Cancer Chemotherapy National Service Center. A study of the comparative effects of 6-mercaptopurine, thio-guanine (6-mercapto-2-amino-purine) and thio-guanosine (2-amino-6-mercapto-9-B-ribofuransylpurine) is nearing completion. Following the departure of Dr. Memee H. King, Dr. Charles Pratt with the aid of a fellowship from the National Institutes of Health has been associated with Professor Wolff and Dr. Sitarz in a program of chemotherapy of solid tumors, especially those with metastatic involvement. As a result of participation in the work of the Combined Pediatric Tumor Clinic, active collaboration with Dr. Thomas V. Santulli, Associate Professor of Clinical Surgery and Associate Attending Surgeon, as well as with members of the Divisions of Radiotherapy and Pediatric Pathology, has been maintained.

The Hematology Research Laboratory, under the direction of Professor Wolff, has continued investigations concerning coagulation abnormalities and on Thalassemia and hemoglobino-

pathies. Professor Wolff in association with Dr. John E. Ultmann, Instructor in Medicine and Assistant Physician, has determined the half-life of autologous and donor red cells and sites of red cell destruction in patients with Thalassemia and with Professor Blumenthal and Dr. Cadvan O. Griffiths the hemodynamic function in this disease was studied by cardiac catheterization. Professor Wolff and Dr. Sitarz have also begun investigations concerning hyperbilirubinemia in premature infants in association with Professors Harris, Mellin, and William A. Silverman and Dr. Katzenstein.

Research activities in the premature nursery are under the direction of Professor Silverman. He is evaluating extrathermal influences of environmental humidity on survival during the first five days of life in small premature infants (birth weight under 1,500 grams). On admission to the nursery infants are assigned in random order to two contrasting conditions of ambient humidity. The body temperature of both groups of infants is maintained at the same level with the aid of a specially designed warming system. The clinical trial has been designed to permit a simultaneous assessment of the efficacy of early and delayed oral feedings in these infants.

The digitalizing dose of digoxin for premature infants in the immediate neonatal period is being investigated by Professor Silverman with Dr. O. Robert Levine and Professor Blumenthal. A Latin square experimental design is utilized to evaluate the response of the infants in relation to birth weight and postnatal age. There is reason to think that the metabolism of digitalis may be unique in newborn infants because of hepatic and renal immaturity.

The effect of aerosolized fibrinolysin on the respiratory-distress syndrome is being investigated by Professor Silverman with Professor William A. Bauman in premature infants (birth weight 1,501-2,000 gm.) who develop dyspnea in the first day of life. A double-blind experimental design is used to evaluate this therapeutic regimen.

In the premature nursery a neurological evaluation of premature infants is being conducted by Professor Silverman with Dr. Elizabeth B. Decker, Assistant in Neurology and Assistant Neurologist in Vanderbilt Clinic and Dr. Sidney Carter, Professor of Clinical Neurology and At-

tending Neurologist. A random sample of newborn premature infants are examined by a neurologist at birth and at fixed intervals thereafter during the nursery stay and after discharge from the hospital. Electroencephalograms are obtained at the time of each evaluation. Dr. Decker is seeking to determine whether neurologic deficits in these infants can be detected in the neonatal period. In studies of intracranial hemorrhage, in collaboration with Professor Blanc, serial (micro) hematocrit measurements are being obtained from premature infants during the first five days of life for the purpose of determining whether a sudden fall in hematocrit during life is associated with the finding of intraventricular hemorrhage at postmortem examination. An investigation of bilirubinemia in premature infants is being carried out by Professor Silverman with Dr. Katzenstein, Professors Harris, Wolff and Mellin. Serial measurements of bilirubin (protein bound and free) protein, pH, heme and calcium are being obtained during the first week of life to determine the possible influence of "diffusing" factors on the concentration of bilirubin in the serum of premature infants. Professor Silverman and Dr. Frederick J. Agate, Associate Professor of Anatomy, are investigating methods of controlling the level and rate of change of body temperature in selected premature infants, using recording equipment and experimental incubators. Professor Silverman with Mrs. Minna Genn is exploring the relation between mental retardation and retrolental fibroplasia. Expremature children with retrolental fibroplasia (cicatrical and non-cicatrical forms) and matched controls are being subjected to psychometrical testing at six to seven years of age.

In the fetal life study under the direction of Professor Mellin follow-up clinics were completed on November 3, 1960, bringing to a close the clinical activities of a study begun in October 1946, and encompassing some 10,200 pregnancies. Handicapped by limited facilities, a devoted staff has continued the tabulation of the first 5,964 cases. The most recent basic data to be developed have been Fetal Life Tables, which indicate the chances of a stillbirth, neonatal death or live birth resulting from a pregnancy depending upon the stage of the pregnancy. An accumulated program to develop data by tabulation on

IBM cards was undertaken early last year for the second part of the study (4,300 cases). A supplementary code was developed, IBM cards produced, and tabulation completed. Definitive tabulation of these cases was begun November 18, 1959. To date 600 cases have been completed. Dr. Elinor F. Downs continued her tabulation of data in the dental study. She also developed a review of children of diabetic mothers, which has been coded. Marginals have been developed from IBM tabulation. A review of erythroblastosis has been coded and punched. An IBM review of pyloric stenosis from 1940 to 1960 has been completed. The effect of viral infection during pregnancy on birth weight of the infant has been studied in forty-seven pregnancies with controls from the basic study population. Mrs. Tatiana Lermontoff is taking serial EEG's on prematures and is cooperating with Dr. Decker in a program of neurological evaluation of the premature. In cooperation with Professor Blanc data are being tabulated and analyzed concerning hematocrit values in the premature in relation to intraventricular hemorrhage and autopsy findings. Dr. Williams is preparing an IBM review of meningitis, also a review of pediatric cardiac arrests. Dr. Katzenstein has obtained smears for chromatin pattern on eight sets of twins who are of different sex, but identical as to blood typing done in Dr. Richard Osborne's study. Dr. Katzenstein has also continued the study of mediastinal shadows in relation to type of delivery to see if "stress" might cause a shrinking of the thymus. He has also developed techniques for obtaining blood samples from prematures and worked closely with the bilirubin study being conducted in cooperation with Professors Harris and Wolff. Professor Silverman and Dr. Jack Shiller have developed a code for tabulation of experience in the premature nursery. Mrs. Thelma Phelan will be responsible for coding this data. The Cleft Palate Clinic, under Dr. George F. Crikelair, Professor of Clinical Surgery and Associate Attending Surgeon, continues to hold group meetings the first Thursday of each month. An IBM code is being developed in cooperation with Dr. Cadvan O. Griffiths, Instructor in Surgery and Assistant Attending Surgeon, to record the experience of this clinic.

With the departure of Professor Conrad M.

Riley from the staff, responsibility for supervision of the care of children with renal disorders was assumed by Dr. Peter R. Scaglione. Dr. Jose Strauss has assisted ably in all phases of the program and Dr. Joseph A. Costa and Dr. Dorothy J. Marlow continue to render valuable and needed services in the active Nephrosis-Nephritis Out-patient Clinic.

Dr. Scaglione and Dr. Strauss continue to study the renal function of children who have survived the nephrotic syndrome four years or more, after early treatment with steroid compounds. Using standard clearance techniques, the data obtained are being correlated with the clinical courses of the patients in an attempt to gain further insight into the efficacy of current therapeutic regimens in the management of childhood nephrosis. Dr. Strauss completed a study showing that premature infants fed high protein diets during the first three days of life cannot concentrate urine adequately. In association with Dr. Gabriel G. Nahas, Associate Professor of Anesthesiology, Dr. Strauss has investigated the use of tri-(hydroxy-methyl) aminomethane (THAM) in the treatment of acute salicylate toxicity induced in dogs. The results indicate that THAM can be life saving to these animals. With the assistance of Mr. Hugh Clark, a senior medical student, these studies are being repeated in rats. Further investigations on the action of THAM by Professor Nahas and Dr. Strauss concern its effect on the renal glucose transport mechanism in pancreatectomized and phloridzinized dogs.

The Departments of Obstetrics and Gynecology, Anesthesia, Psychiatry, and Neurology are working jointly with the Department of Pediatrics on the basic core of the Child Development Program. Dr. Gates is project director of this long-term prospective study seeking the etiology of cerebral palsy and related neurological and mental disturbances. In addition, other departmental investigators are conducting related studies, all under the sponsorship of the National Institutes of Health. Ancillary studies in departments other than pediatrics are described within the body of their departmental reports. The year 1960 was one of marked expansion in activities and participation. Gravidæ enrolled numbered 600, a twenty per cent increase over last year. These women were followed throughout pregnancy in

antepartum clinic by specially trained observers and interviewers under the direction of Dr. Emanuel A. Friedman, Assistant Professor of Obstetrics and Gynecology and Assistant Obstetrician and Gynecologist. Data regarding past health, pregnancies, and socio-economic status was collected and participants closely followed on admission by study nurses during labor and delivery. In July 1960, Dr. Vincent Freda of the Department of Obstetrics and Gynecology, joined the program to work with Dr. Friedman.

Four hundred and eighty-five infants, born during 1960, were each seen for three successive examinations by program pediatricians working under Dr. Elizabeth Ufford. Newborn neurological examinations were also completed on these babies by Dr. Donald Schotland and Dr. Lucien Cote, working under the direction of Dr. Niels Low, Assistant Professor of Neurology and Assistant Attending Neurologist, who began active participation in February 1960, replacing Dr. James Hammill. Newborns also had laboratory determinations to detect possible deviations from normal.

In the pediatric section of Vanderbilt Clinic 427 four-month-old infants were examined by study out-patient pediatricians who were joined in 1960 by Dr. Elizabeth Turnauer and Dr. Thomas W. Patrick, Jr. Dr. Katz worked as a fellow covering both newborn and four-month examinations until July when he joined the Babies Hospital House Staff. In October, Dr. Hyman Gelbard assumed a similar position for the remainder of the year. Dr. Rhoda Mickey joined the group in September to cover primarily the newborn phase.

At the eight-month level, 424 infants had psychological testing under the supervision of Dr. William N. Thetford, Associate Professor of Clinical Psychology. The area for this examination is a renovated groundfloor apartment at 238 Fort Washington Avenue.

At one year of age, 268 infants were seen for neuro-pediatric examinations, again under Professor Low's direction. In 1961, these examinations, now held at 238 Fort Washington Avenue, will move to 617 W. 168th Street.

The study nursing staff has spent much time and effort in maintaining patient contact and interest. As a result, the percentage of returns for repeated examinations exceeds earlier expecta-

tions. A home visit is paid to each child at eighteen months of age. Preparations are now being made for two-year pediatric examinations, also to be conducted at 617 W. 168th Street.

In addition to the above activities Professor Blanc has done gross and microscopic examinations of the placenta on every study postpartum patient. Post mortem examinations have been conducted on study stillbirths and infants who died in the neonatal period with only a single exception.

Research as well as clinical activities in cardiology have been carried out under the guidance of Professor Blumenthal. Dr. Sylvia P. Griffiths and Dr. Gerard Turino, Assistant Professor of Medicine and Assistant Physician, have investigated cardiac performance in patients with Cooley's anemia. A study of progressive changes in the electrocardiogram and vectorcardiogram of normal infants from birth to six months has been conducted by Dr. Katherine H. Halloran. Professor Blumenthal and Dr. Griffiths have participated in a cooperative study of the treatment of patients with acute rheumatic fever. Dr. Levine has undertaken a study of digitalis dosage in premature infants. Other investigations by Professor Blumenthal and his associates include observations of hemodynamic changes in congestive heart failure in infants and a prospective study of the natural history of patients with ventricular septal defects. Professor A. Gregory

Jameson has explored indicator dilution techniques utilizing hydrogen as the test agent.

Donors

Many individuals and organizations materially contributed to the operational and research activities of the department. The entire staff expresses sincere gratitude to these loyal and generous contributors: The National Institutes of Health, Association for the Aid of Crippled Children, Lillia Babbitt Hyde Foundation, Mead Johnson & Company, National Cystic Fibrosis Research Foundation, The National Foundation, The Kidney Disease Foundation, The New York Heart Association, The Nutrition Foundation, The United Fruit Company, The Mary Louise Johnson Foundation, The Trudeau Foundation, Sidney J. Weinberg Foundation, Loyal League Philanthropies, Beatrice Needle Craft, Inc., The Gordon Foundation, The Aaron E. Norman Fund, Inc., The Alumni Association of The Babies Hospital and to many individual benefactors including grateful parents and friends.

It is a pleasure also to express grateful acknowledgment for the continued support and efforts of the Board of Women Managers of The Babies Hospital. They have contributed to the care of ward and clinic patients and the provision of gifts for them at Christmas and other times and also to the Emergency Nursing Fund, Recreational Therapy, Pediatric Psychiatric Clinic, Volunteer Department and House Staff Loan Fund.



Pharmacology

HARRY B. VAN DYKE, *Hosack Professor and Chairman of the Department*

During 1960, no major changes were made in the educational program. An important redistribution of most courses in the second year was introduced in 1959, and continues to be regarded as an improvement over the previous schedule. The course for the second year students was enriched by the participation in teaching by members of other departments who gave lectures or demonstrations or both. Fields and principal cooperating teachers were: anesthesia, Dr. Emanuel M. Papper, Professor of Anesthesiology and Director of the Anesthesiology Service; anticonvulsive drugs, Dr. Sidney Carter, Professor of Clinical Neurology and Attending Neurologist; chemotherapy of neoplasms, Dr. Alfred Gellhorn, Professor of Medicine and Attending Physician; metals in chemotherapy and toxicology, Dr. John V. Taggart, Professor of Medicine and Attending Physician; and respiratory pharmacology, Dr. Gabriel G. Nahas, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist. Two new members joined the staff of the department: Dr. Rudolf P. Bircher was appointed Lecturer, and Dr. Michael Ginsburg of the University of Bristol, England, was appointed Visiting Associate Professor for the academic year, 1960-1961.

A large number of visitors, from the United States and abroad, discussed educational methods and scientific problems with the staff. Seminars, which were attended by the staff and the graduate and postgraduate students, were given at frequent intervals. Among the foreign visitors who gave lectures sponsored by the department were Dr. Ginsburg of the University of Bristol, Dr. B. Mukerji of the Central Drug Institute of India at Lucknow, Dr. Anthony Perks of the University of St. Andrews, and Dr. Mary Pickford of the University of Edinburgh.

A continuing effort is made by the department to promote the training of pharmacologists as graduate students or as postgraduate investigators. Professor Frederick G. Hofmann lectured to undergraduate students of Amherst College

and Wesleyan University concerning opportunities for training and a career in pharmacology. Two undergraduate students assisted in research during the summer under the direction of Professors Hofmann and Shih-Chun Wang. During a period of three months, two third year medical students participated in research projects of Professors Herbert J. Bartelstone and Wilbur H. Sawyer. Two medical students undertook research periodically under the direction of Professor Wang. Dr. Jay Robbins, who has worked on various projects in the department throughout his undergraduate days, completed another project in which he demonstrated, by autoradiographic means, that the administration of 5-hydroxytryptophan-3-C¹⁴, a serotonin precursor, resulted in the specific localization of radioactivity in the enterochromaffin cells of the guinea pig duodenum. A third year medical student, Richard Ulin, worked on morphine-induced mydriasis in the cat and found that the drug caused a depression of the oculomotor system as well as a stimulation of the sympatho-adrenal system. A grant made by the National Institutes of Health for the training of graduate students in pharmacology has immensely facilitated this aspect of the department's educational program; six students were supported by this or other grants. In addition, Professor Wang is the director responsible for a postgraduate training program in neuropharmacology, also supported by a grant from the National Institutes of Health. Four postgraduate fellows are working under the sponsorship of this grant or under funds from other sources.

During the first half of 1960, Professor Harry B. van Dyke was on sabbatical leave. He served as Visiting Professor of Pharmacology in the University of Malaya in Singapore. He also visited colleges of medicine and research institutes, and gave lectures in the Far East, the Middle East, and Europe.

Research programs were directed by all members of the staff. Norman Kahn, who graduated from the School of Dental and Oral Surgery in

1958, is working as a Ph.D. candidate, under Professor Wang's direction, on the splanchnic discharges which follow drugs acting on the central nervous system. Dr. Ronald L. Katz, who has had two years of residency training in anesthesiology, became a postgraduate trainee in 1959. In collaboration with Professors Shih-hsun Ngai, Associate Professor of Anesthesiology, Nahas, and Wang, he completed a manuscript on the effect of THAM, an organic buffer, on the central respiratory mechanism in the cat. In addition, two other research fellows were sponsored by the China Medical Board of New York, Inc. Dr. Charles C. Y. Chai used microelectrodes to localize the vasomotor region in the brain stem of the cat, with results far more accurate than those reported previously. Dr. H. S. Fang, Professor of Physiology in the National Taiwan University, is completing an investigation of the hypothalamic points which liberate antidiuretic hormone from the neurohypophysis of the dog. This investigation had been initiated during Professor Wang's sabbatical leave, when he was Visiting Professor in Taiwan in 1958.

Dr. Bircher, Dr. T. Kanai, and Professor Wang demonstrated that cardiac arrhythmias induced by convulsive doses of pentylenetetrazol or picrotoxin are central in origin and are accounted for by stimulation of the vagal and sympathetic centers in the medulla oblongata of the dog. Dr. Kanai has localized an area for provoking vocalization, and outlined its descending pathway in the brain stem of the cat. Dr. Kanai, Dr. Hsieh-Hwa Wang, and Professor Wang investigated the central effects of various psychomimetic drugs by means of cross-circulation experiments and found that chlorpromazine perfused only to the head circulation altered its vasomotor responses. Dr. Wang, Dr. Marvin R. Blumenthal, and Professor Wang studied the circulatory effects of experimentally induced aortic stenosis in the dog, and observed that such a procedure produced dilatation of the coronary arteries.

Professor Bartelstone rejoined the department after completing his thesis and receiving the Ph.D. degree in June, 1960. He has continued work on the venous system, in part, in collaboration with Dr. Wang. An important aspect of the total cardiovascular response to carotid occlusion was shown to be the increase in venous return in-

duced by venous constriction. Failure of the veins to supply extra blood to the heart during carotid occlusion causes a fall in cardiac output, and a marked decrease in the typical arterial-pressure responses. In these experiments, cardiac output remained relatively unchanged during carotid occlusion.

Professor Sawyer, in collaboration with Dr. Robert A. Munsick and Professor van Dyke, has continued studies on the characterization of neurohypophysial hormones in a variety of animals by pharmacological means. Particular attention has been paid to primitive mammals. Although reptiles and birds have arginine vasotocin as a natural neurohypophysial hormone, both monotremes and marsupials appear to have arginine vasopressin. This implies that arginine vasopressin displaced arginine vasotocin as the antidiuretic-vasopressor principle of the neurohypophysis very early in mammalian evolution, probably in the premammalian reptiles. They have also found that the collared-peccary neurohypophysis contains arginine vasopressin. This is surprising, since Old World pigs and hippopotami both secrete lysine vasopressin. The peccaries are commonly believed to be more closely related to the Old World pigs than is the hippopotamus. The appearance of arginine vasopressin in the peccary neurohypophysis may represent a reverse mutation from the lysine vasopressin that could have been present in an ancestor common to pigs, peccaries, and the hippopotamus. It is quite possible, however, that the peccaries evolved along lines quite distinct from those leading to the hippopotamus and Old World pigs. In this case these pharmacological studies may provide information on phyletic relationships in a group of mammals in which the paleontological evidence is inconclusive.

Studies on the relationships between the molecular structure of neurohypophysial peptides and their analogues and a variety of physiological responses have been continued. Professor Sawyer and Dr. Wah-Yip Chan have studied the antidiuretic activity of various analogues of the vasopressins in the dog and the rat. Analogues with an 8-lysine moiety, as in lysine vasopressin or lysine vasotocin, have much less antidiuretic activity on the dog than on the rat when compared to their 8-arginine counterparts. Lysine analogues

(8-lysine) also have a much briefer antidiuretic action in rats than do 8-arginine analogues. The relationship of chemical structure to activity on the isolated frog bladder also received further study. Peptides containing the ring of oxytocin are active on this assay, arginine vasotocin being by far the most potent.

Dr. Chan completed his thesis work on the natriuretic action of arginine vasopressin, arginine vasotocin, oxytocin, and oxytocin in dogs. Arginine vasopressin can cause natriuresis if administered to dogs during water diuresis, but not when the rate of urine flow is low. Oxytocin, on the other hand, cannot cause natriuresis in the presence of water diuresis. The action of oxytocin appears to be central, since it is more effective if injected into the carotid circulation than if injected into a peripheral vein. Large doses injected into the renal artery are ineffective in provoking natriuresis. Arginine vasotocin has a strong natriuretic effect resembling that of oxytocin and arginine vasopressin. Oxytocin is quite weak in this respect.

Mr. Robert Winslow, a third year medical student, and Professor Sawyer made further studies on the action of neurohypophyseal peptides on the isolated frog bladder. These principles can stimulate the active transport of sodium from mucosal to serosal surfaces, as well as increase the passive movement of water following an osmotic gradient. It is possible, by filling the bladder with a hyperosmotic solution, to enhance sodium movement in one direction while increasing water movement in the opposite direction. Removing sodium from the mucosal solution, or adding theophylline to the serosal solution can effectively abolish sodium transport without necessarily inhibiting water movement in response to neurohypophyseal hormones. These findings further strengthen the belief that sodium transport is not necessary to account for water movement across the bladder wall. This is of some general interest because the action of neurohypophyseal antidiuretic hormones on the distal renal tubule is believed to be analogous to their effects on the amphibian bladder. Mr. Winslow has also been studying the influence of changes in calcium concentration in the serosal medium on the response of the bladder to neurohypophyseal hormones. Reducing calcium concentration, or adding a

chelating agent such as EDTA, can influence water permeability in a manner somewhat similar to that observed after the addition of oxytocin.

Professor Hofmann continued his studies of steroid biogenesis in normal and neoplastic tissues. The microsomal fraction of guinea-pig adrenal glands was further investigated with regard to its content of nucleic acids, its appearance under electron microscopy, and the kinetics of the hydroxylases that it contains. The equipotency of TPNH and DPNH, as cofactors for the C-17 hydroxylating system, was demonstrated. Professor Hofmann was also able to show that the C-17 hydroxylating system of rat testes was able to act in concert with the C-11 and C-21 hydroxylating systems of rat adrenals to convert progesterone to cortisol.

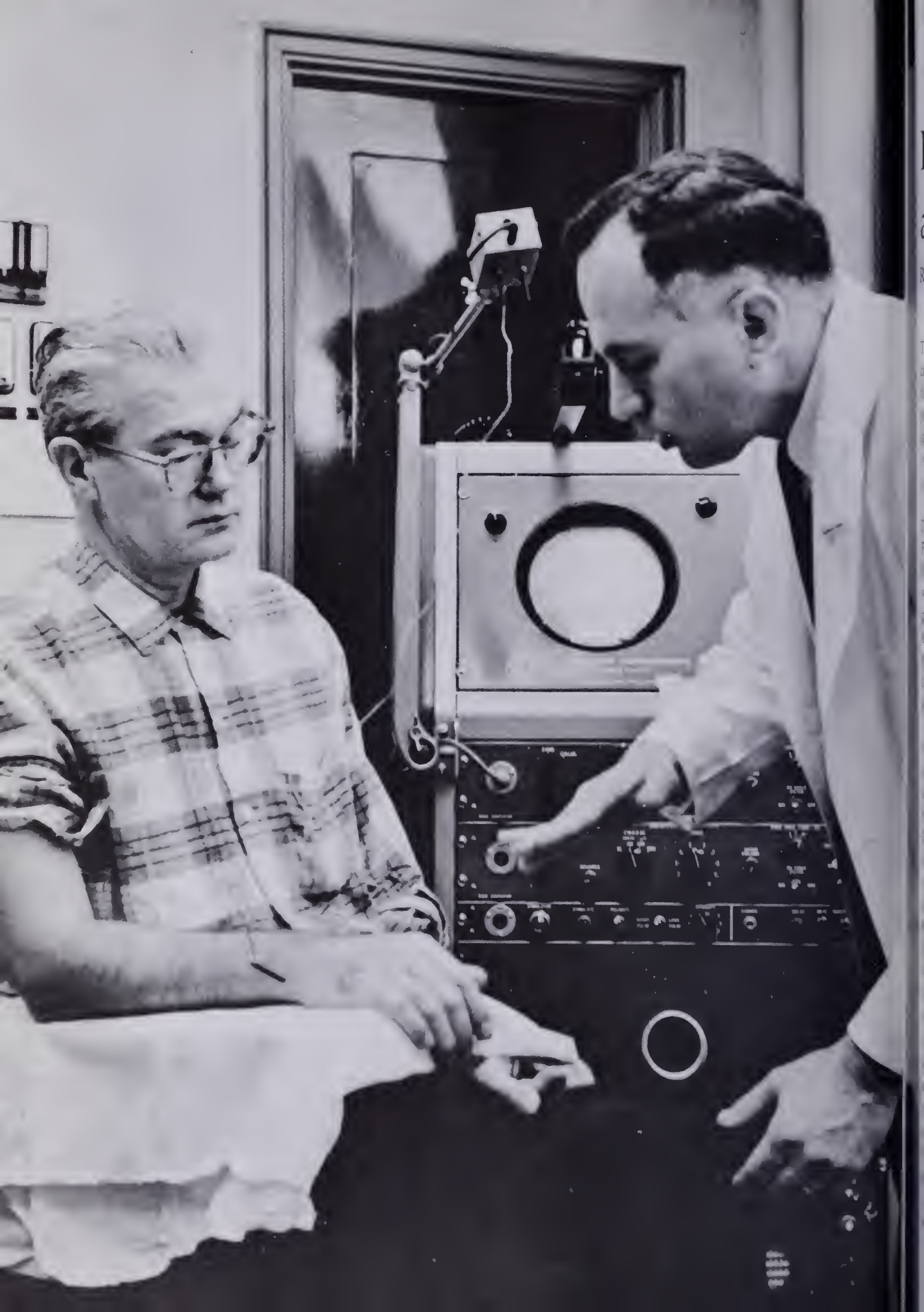
In collaboration with Dr. Nicholas P. Christy, Assistant Professor of Medicine and Assistant Attending Physician, Professor Hofmann continued his studies upon gonadectomy-induced adrenal tumors in mice. Further deficiencies in the neoplastic tissue with respect to the enzymic systems participating in steroid biogenesis were delineated.

Dr. Miriam W. Carmichael, a Fellow of this department in neuropharmacology, completed her research work in association with Dr. Dominick P. Purpura, Associate Professor of Neurological Surgery. Their first study revealed that ω -amino acids, which produce synaptic effects, when systematically administered only when "the blood-brain barrier" is destroyed, failed to alter responses evoked by surface cortical stimulation in newborn animals. The presence of a functioning barrier at birth in the cat was thereby established. The study also demonstrated the effects on the blood-brain barrier of rapid loading of animals with GABA and provided a means for assessing its functional integrity following various traumatic procedures. In another study, it was observed that succinylcholine induced generalized contractures of considerable severity in neonatal kittens. EMG recordings indicated that the skeletal muscles were fully innervated functionally, and a wide spectrum of inhibitory and excitatory spinal reflex activity was elicited. Succinylcholine failed to induce generalized contractures after the tenth to twelfth postnatal day. It was suggested that the sensitivity of skeletal

muscles to cholinomimetic agents was high in near-term fetal and neonatal kittens, and that during postnatal ontogenesis membrane properties of muscle change so that the sensitivity of the membrane to succinylcholine becomes restricted to the end-plate region. In a third research project, neocortical axodendritic synaptic organizations involved in the production and spread of evoked superficial cortical responses (SCR's) were studied in kittens ranging in age from the late fetal stage to six weeks. It was concluded that the distinctive electrographic characteristics of SCR's in neonatal animals are attributed to summation of ten to twenty msec postsynaptic potentials generated in densely packed apical dendrites of pyramidal neurons and dendrites of embryonic Cajal-Retzius cells. Regression of the dendritic system of the latter cells, decrease in apical dendritic density, increase in conduction

velocity of axons in the molecular layer and changes in the SCR-activity cycle are considered the major factors associated with maturation of superficial neocortical neuropil.

Special acknowledgement must be given to foundations, government agencies and pharmaceutical firms for generous support of both the educational and the research activities of the department. The National Institutes of Health have granted invaluable support for research work in the department, and have made possible a dependable expansion of the program for training pharmacologists. Fellowship support or support for research have also been given by the China Medical Board of New York, Inc., the School of Aviation Medicine of the United States Air Force, Charles Pfizer and Company, Sandoz Pharmaceuticals, and E. R. Squibb and Sons.



Physical Medicine and Rehabilitation

ROBERT C. DARLING, *Professor and Chairman of the Department
Director of Service*

The current year has been signalized by no special innovations but rather by further progress in the development of long-term goals indicated in previous reports. Plans for the inpatient rehabilitation service on the eighth floor of Neurological Institute have been completed and construction started.

The University has honored the memory of Dr. Simon Baruch by setting up the Simon Baruch Professorship in Physical Medicine and Rehabilitation, of which the Chairman of the department will be the first incumbent. Dr. Baruch was a pioneer in hydrotherapy and Professor at the College of Physicians and Surgeons from 1907 to 1915. His field was the actual forerunner of the presently expanded specialty of physical medicine and rehabilitation.

The introduction of teaching exercises in physical medicine and rehabilitation into the group clinic is now a reality. The plan for these exercises dates back several years but it was only through funds granted by the Office of Vocational Rehabilitation of the United States Department of Health, Education, and Welfare, that the necessary additional personnel could be procured to put it into effect. The purpose of the exercise is to introduce rehabilitation concepts and techniques at a point in the medical student's career where he is beginning to take responsibility for individual patients. At a meeting of a seminar type, once a week, a student presents one of his patients having rehabilitation problems to a team consisting of a physiatrist, a social worker, a vocational counselor-psychologist, and others as the case requires. The other students in the group clinic at the time attend and participate in the discussion. The team discusses the case, any generalizations to be derived are presented, and a program for evaluation and treatment by the team is decided upon. The case is discussed fur-

ther at follow-up sessions and finally a plan of action is determined and executed. In this way, students have an opportunity to adopt into their thinking some rehabilitation concepts and techniques and at the same time to recognize the value to the patient of rehabilitation consultation and of the contributions offered by the various members of the rehabilitation team. Mrs. Selma Bornstein has joined the department as Assistant to serve as the social work member of this team, with other teaching functions relating to resident training. This teaching exercise is, of course, in addition to the regular offerings under this department in physical diagnosis and in public health and administrative medicine.

Professor William Benham Snow retired from active status on June 30 and a testimonial dinner was given in his honor. He assumed the titles of Professor Emeritus in the College and Consultant in the Hospital. His long experience in clinical and educational areas makes it impossible to replace him in any real sense and it is to our advantage to have his counsel and help in his emeritus status on special occasions. The actual replacement for his position has been delayed pending the availability of a highly desirable candidate. In the meantime, Dr. Nathan Kaplan, as Senior Fellow in the department, has taken on additional responsibility to fill the gap, and part-time members of the department have increased their duties to complete the transition.

Professor Shyh-Jong Yue became the full director of physical medicine at St. Luke's Hospital and continues part-time at the Center, being responsible for coordination of the resident training program.

Professor Robert C. Darling continues to collaborate with Dr. Abraham Jacobs, Professor of Education at Teachers College, in a course on the medical aspects of rehabilitation for students

at Teachers College who are preparing for vocational counseling, speech therapy, physical education, and nursing in the rehabilitation field. Professor Darling is currently President of the New York Society of Physical Medicine and Rehabilitation.

Dr. Kaplan with Professor Darling is exploring the usefulness of electromyography in facial palsy and in disorders of the palate with the collaboration of members of the Department of Otolaryngology and of Plastic Surgery Service respectively.

Professor A. David Gurewitsch in his capacity as Director of Physical Medicine at Blythedale Orthopedic Hospital and Rehabilitation Center for Children, has allowed the trainees in this department to attend various exercises of an educational nature at that institution wherein they have access to clinical material not readily available at the Medical Center.

Professor Morton Hoberman in his additional position as Chief of Physical Medicine and Rehabilitation at the New York State Rehabilitation Hospital, has collaborated actively in the transition of patient care between that Hospital and this institution.

In November, Dr. Erling Asmussen, Associate Professor at the Laboratory for Theory of Gymnastics, and scientific director of the Testing and Observation Institute of the Danish Association for Infantile Paralysis in Copenhagen, conducted a seminar on the evaluation of working capacities of handicapped patients for a group of invited guests from the New York Metropolitan area. This seminar was supported by a grant from the United Cerebral Palsy Associations of New York State.

During this year 59,928 patient visits were made to the department and a total of 88,224 treatments were given. Of this latter total, 7,055 were occupational therapy and 81,169 were physical therapy. Fifty per cent of the treatments were to clinic patients, twenty-two per cent to private patients, eighteen per cent to ward, and ten per cent to semiprivate patients.

Occupational Therapy Courses

The number of students enrolling for these courses increased significantly in the past year, namely from thirty-nine to fifty as a total for those in both the academic and the clinical

phases. The total number of students graduated was fourteen. All of these students passed the national registration examination in occupational therapy, obtaining grades which ranked them third among the nineteen schools participating.

In June, the University kindly permitted the graduating students in this program to participate in the commencement exercises although their degrees and certificates were not awarded until some months later. This move has been helpful in increasing the esprit de corps of the students and their sense of belonging to the University.

The increase in enrollment noted above can be traced definitely to the active program under the direction of Mrs. Adelaide Deutsch, Instructor in Occupational Therapy, concerned not only with direct recruitment in occupational therapy but with the general education of college students in the health professions. This program has been possible partly through the reinstitution of a teaching grant from the Office of Vocational Rehabilitation and also through a small grant from the United Hospital Fund. Programs of orientation to health careers and particularly to occupational therapy were held in forty-five schools and colleges at meetings attended by over 2,000 students. Perhaps more significant was the plan of summer work experience arranged through fifteen cooperating hospitals: twenty-five college students were selected from 150 applicants; practically all of these decided upon health careers after the experience, one half of them specifically on occupational therapy. An open-house demonstration and discussion session was held at which over 100 students and thirty guidance directors attended.

Changes in the curriculum consisted chiefly in the better coordination of existing courses. Regular discussion sessions are now held by instructors in closely related courses. The prerequisite requirement in psychology was somewhat increased. It is now possible to offer a course in neuroanatomy to all students, previously not possible for certificate students. Upon Professor Snow's retirement, Professor Darling assumed the title of Medical Director of these courses.

Mrs. Sara Philcox from the University of Queensland of Australia, was a visiting fellow here for eight months as a Fulbright Scholar.

Students in the nine months of clinical affilia-

tion following their academic course were placed in four psychiatric hospitals; nine rehabilitation centers, eight general hospitals and three tuberculosis hospitals. In October an all-day conference was held with directors of occupational therapy in many of these, as well as other centers, to communicate the educational desires of the faculty on one hand, and the problems and interests of the clinical directors on the other.

There is obvious need to continue and strengthen the recruitment and public education program in order to meet in part the great national demand for graduates of these courses. Likewise, there would seem to be a further need to inform more of the medical faculty members of the activities in occupational therapy education; a projected medical advisory committee is being considered for this purpose as well as to improve the training of the students themselves.

Physical Therapy Courses

Bachelor of Science degrees were awarded to fifteen students and certificates to twelve. Currently, the number of students enrolled is thirty-nine. It is notable that the amount of scholarship support available to students has decreased markedly, there being only six students under such support in the present group.

To improve coordination in teaching, a blocking of the basic science courses in the first semester has been arranged. Early experience indicates the wisdom of this plan, and it is expected that other groups of courses will be coordinated, perhaps not by blocking of time for courses, but by more frequent interchange of information between instructors in allied subjects.

Experience in the course in advanced kinesiology given by Miss Signe Brunnstrom, Instructor in Physical Therapy, proves its value as a required course for seniors and also as a postgraduate course for therapists in the community, which is presented in a separate section. This course will continue to be given in these two sections, since the demand from therapists in the community is so great.

A kinesiology teaching manual prepared by Miss Brunnstrom under the support of a grant from the Office of Vocational Rehabilitation has

proved an important teaching aid; it is planned after further trial to publish this in a form suitable for a wider audience. The grant from the Office of Vocational Rehabilitation for the recruitment program in occupational therapy under Mrs. Deutsch has been instrumental in attracting students to physical therapy as well.

Professor Mary E. Callahan, Director of the Physical Therapy Courses, on sabbatical leave from February 1 to July 31, visited and observed physical therapy teaching from Massachusetts to Puerto Rico, as well as giving lectures and reviewing professional literature.

Miss Anne Rumpler completed a two-year program as a Fellow under the National Foundation teaching program; she combined a program for a degree of Master of Arts at Teachers College with added experience in administration and teaching in the physical therapy courses.

A survey was made of the 452 graduates of the physical therapy program since its inception. Of those answering the questionnaire, it is notable that only about one quarter are no longer active professionally, although an additional number have left physical therapy in favor of some other related profession.

Upon the retirement of Professor Snow, Professor Darling became Medical Director of the physical therapy courses. A scholarship fund in Professor Snow's name was established for physical and occupational therapy students; this fund was set up as a perpetual one to which additional contributions are sought on a continuing basis.

There is considerable evidence that the physical therapy educational program has a greater potential than is realized. The high quality of medical instruction available at the Medical Center is much more advantageous than that available to schools of physical therapy not connected with medical faculties. The survey mentioned above indicates that graduates are functioning at a high professional level. What is needed is the attraction of more students to complete the fully allowable complement. There is obvious need to work for more scholarship assistance, better dissemination of information among potential students, and improvement of teaching facilities.



Physiology

MAGNUS I. GREGERSEN, *Dalton Professor and Chairman of the Department*

Dr. Raimond Emmers, from the laboratory of neurophysiology of the University of Wisconsin Medical Center, will join this department as Assistant Professor in January, 1961. Dr. Colin Fell from Dr. R. F. Rushmer's laboratory at the University of Washington Medical School, Seattle, was appointed Instructor in July. Dr. Martin Blank, Instructor, has been awarded a Senior Research Fellowship by the United States Public Health Service. Dr. Antonio Agostini, Research Associate with Professor J. H. Schulman in the Stanley Thompson Laboratories at the Columbia School of Mines, who has been a guest in this department since last spring, was appointed Research Associate in Physiology in November. Dr. Agostini originally came from the University of Rome where he graduated in medicine. Dr. Masayasu Sato from Kumamoto Medical School, Japan, has been appointed Visiting Professor in Physiology, and Dr. Kashima Goto from Gunma University, Japan, has been appointed Visiting Fellow. Dr. George Wakerlin, for many years Head of the Department of Physiology at the University of Illinois School of Medicine, and now Medical Director of the American Heart Association in New York, has been appointed Adjunct Professor.

This department has made several successive changes and adjustments in contents and schedules of the medical and dental courses in physiology, in order to coordinate the timing and content of these courses with the changes in the medical curriculum instituted by the curriculum committee. Professor Shu Chien is in charge of the course in physiology for the medical students, and Professor Mero Nocenti is in charge of the two courses for the dental students. Professor Louis J. Cizek has continued as director of the Summer Session courses in physiology. Those offered at the Columbia campus were given by Dr. George Cooper. The training program for graduate students and postdoctoral fellows in physiology continues to be directed by Professor William L. Nastuk. An increasing number of

applicants of high quality are now being processed. Under the present teaching schedule, it is evident that there would be great advantages in relocating the teaching laboratories, now on the third floor, to the eleventh floor, adjacent to the research laboratories and offices of the staff.

With the addition of Dr. Blank to the staff a year ago, and because of a growing community of interests between this laboratory and the Department of Physical Chemistry on the campus and the Stanley-Thompson Laboratory, this department is giving increased attention to studies of bio-physical phenomena. Dr. Blank has been mainly concerned with the movement of oxygen and carbon dioxide across monomolecular films as a means of understanding plasma membrane permeability. Mr. Stephen Feig and Mr. Samuel Essandoh, medical students on summer research fellowships working under Dr. Blank's direction, extended the study of monolayers as membrane models to an investigation of the behavior of charged systems. Dr. Agostini is chiefly concerned with the interpretation of ion fluxes through nonaqueous liquid membranes. Mr. H. Schiff, medical student from Professor Schulman's laboratory, worked with Dr. Agostini on physiological aspects of this problem.

Professor Nastuk has continued his studies on the possible etiological role of immunological factors in myasthenia gravis. Recent developments indicate that this approach may indeed be fruitful. The collection and assay of blood and tissue samples from myasthenic patients is being carried out with the assistance of Dr. Maxcy J. Smith and Mr. Arthur Manthy, in cooperation with Dr. Arthur J. L. Strauss, Visiting Fellow in Microbiology, and a long standing colleague in this work. In cooperation with Dr. Leonard Levine, United States Public Health Service Postdoctoral Fellow, and Dr. James B. Campbell, Associate Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, Professor Nastuk continued the study of neuro-secretion from the regenerating nerve tip. Preliminary

results indicate that the amount of acetylcholine liberated rises as the nerve tip, which is prevented from outgrowth, matures. With the assistance of Mr. William G. Nevel, medical student, Professor Nastuk completed construction of a new automatic six channel recording myograph. This instrument was used by Mr. Nevel during the summer to begin studies with a neuromuscular blocking agent, hexafluorenum. With Dr. Norman Kahn, Professor Nastuk has made a study of the blocking action of thiamine on neuromuscular transmission and membrane conduction. Professor Nastuk collaborated with Dr. Francis F. Foldes, Director of Anesthesiology, Mercy Hospital, Pittsburgh, in the preparation of a film "Muscle Relaxants," sponsored by Irwin Neisler and Co. This film, first shown in September, is now in circulation. Professor Nastuk also continued his experiments on the nature of the permeability change produced at the endplate membrane during its reaction with acetylcholine. Experiments now in progress are concerned with a test of a theory of receptor activation-inactivation.

Professor Nastuk continued as editor of "Physical Techniques in Biological Research," Volume 4 (now in press), which contains a section by Professors Chien and Magnus I. Gregersen, on "The Volumetric Determination of Body Fluids." Professor Nastuk has served as vice-president and member of the board of directors of the New York State Society for Medical Research. He is also a member of the editorial board of *Physiological Reviews*, and a member of the Physiology Study Section, United States Public Health Service.

Professor Chien has conducted intensive investigations of the compensatory mechanisms in hemorrhage, comparing the responses in normal splenectomized dogs with those in totally sympathectomized-splenectomized dogs. With Mr. Lawrence Krakoff, medical student, Professor Chien has investigated the effects of histamine on splanchnic blood flow and splanchnic blood volume, a study which provides a better understanding of the circulatory disturbances in the histamine shock described by Dr. Deyrup in this laboratory in 1946. With Dr. Zacharias Dische, Professor of Biochemistry (Ophthalmology), and Professor Cizek, Professor Chien has investi-

gated the mucopolysaccharides in the submaxillary secretion of dogs. With Mr. Bernard Hitzig, Professor Chien reported the results of a study defining the tolerance of sympathectomized dogs to hemorrhage, which incidentally showed that total sympathectomy increased blood volume. This settles a problem of long standing. Professor Chien and Mr. Stuart L. Billig, fourth-year medical student, published results of their investigation on the changes in the Fcells value in sympathectomized-splenectomized dogs after hemorrhage.

Dr. Shunichi Usami has been investigating the time course of adrenal steroids secretion before and after hemorrhage in normal dogs and is collaborating with Professor Chien in investigations on the compensatory mechanisms of body fluids after hemorrhage.

Under the direction of Professor Walter S. Root, and in collaboration with Dr. Deogracias R. Rodil from the Philippines and with Dr. Charles E. Wolf, Visiting Fellow in Anesthesiology, Dr. Elizabeth C. Gerst is attempting to establish the degree of hypoxic stress necessary to elicit significant sympatho-adrenal activity in dogs with chronically denervated hearts. The animals are subjected to both acute and chronic types of hypoxia. The magnitude of the sympatho-adrenal response is measured by the increase in rate of the denervated heart and by chemical analysis of the plasma catechol amine levels. The aim is to find the arterial blood oxygen threshold at which the response is first elicited, the duration of the response to chronic hypoxia, the role of carbon dioxide, and the receptor sites at which low blood oxygen and elevated carbon dioxide levels act to elicit the response.

Professor Root was elected an Associate Fellow of the New York Academy of Medicine, secretary-treasurer of the Society for Experimental Biology and Medicine, and managing-editor of the *Proceedings of this Society*. During the year he continued to serve as chairman of the Committee on Animal Care; as a member of the Medical Science Screening Committee (Fulbright awards), of the Physiology Test Committee, National Board of Medical Examiners, and as a director of the New York State Society for Medical Research. He was appointed Institutional Representative of the Animal Care Panel, and served

on the membership committee of the American Physiological Society.

Professor Werner R. Loewenstein and his associates have continued to work on the mechanisms of excitation and nerve impulse production at sensory receptors utilizing the Pacinian corpuscle as the main object of study. Two significant break-throughs on the mechanisms of energy conversion at receptors were made: Dr. Nobusada Ishiko and Professor Loewenstein showed that the convertor process is of a statistical nature, and that there is a high energy barrier at one of its stages. Dr. Sidney Socolar, Research Associate, and Professor Sato have analyzed some aspects of the convertor process; and Dr. Goto has started work on modulation of the convertor process by afferent nervous control. Professor Loewenstein gave the Louise Block Lectures at the University of Chicago, and was also guest lecturer at the Naval Medical Research Institute. He has contributed the section on "Mechanoreceptors; the Production of Nerve Impulses at Receptors" to the Encyclopedia of Science and Technology.

Professors Nocenti and Cizek have embarked on a three-year study of the endocrine factors operating during starvation-induced salt deficiency, supported by a National Science Foundation research grant. With the assistance of Mr. Murray Epstein and Marc Newberg, medical students, Professors Nocenti and Cizek have studied the hormonal influences in the food-deprivation salt-deficiency syndrome. Professor Nocenti and Mr. Edwin G. Fischer, medical student, in collaboration with Dr. Clement A. Furey, Jr., Assistant in Urology and Assistant Urologist, have undertaken a study of the effect of adrenal cortical hormones on experimental connective tissue granulomas. Professor Nocenti has prepared a new section on the endocrines for the forthcoming edition of Bard's Medical Physiology, now in press.

Dr. Fell, is investigating the changes in blood

distribution in cats by a regional weighing technique which he developed at the University of Washington while working with Dr. Rushmer. The study will include the responses not only to hemorrhage but also to drugs, nervous influences and transfusion of various materials. The technique promises to be of value in a variety of problems of special interest in this department.

At the invitation of Captain Robert Phillips, Director of the United States Naval Medical Research Unit in Taipei, Taiwan, Professor William W. Walcott spent the fall semester as consultant to the unit, investigating the replication in monkeys of the diarrhea and fluid loss characteristic of cholera. Before returning home he accompanied Captain Phillips to a medical conference in East Pakistan to report their findings at the dedication establishing the SEATO Cholera Research Laboratories at Dacca.

Professor Robert J. Dellenback is continuing the study of the metabolism of brain tissue and the influence of various ions, especially calcium, in collaboration with Dr. David A. Ringle. Their aim is to obtain information at the cellular level concerning the basic mechanism of action not only of tranquilizer drugs recently developed, but of a variety of drugs which have known physiological effects. Professor Dellenback also completed a study begun with the collaboration of Dr. Rowley, formerly of this department, on the effects of x-irradiation on the chemical composition of rabbit brain. Dr. Ringle, working under the direction of Professor Gregersen, is studying methods of determining the specific gravity of small brain tissue samples from various localized areas of the dog's brain. Dr. Ringle is also setting up a technique for the *in vitro* double perfusion of isolated livers. This technique is to be used for metabolic blood flow, and blood volume studies. With the assistance of Miss Jean Moroney, Professor Gregersen is continuing the study of the chemical anatomy of brain tissue.



Psychiatry

LAWRENCE C. KOLB, *Professor and Chairman of the Department
Director of Service*

With great sadness the department reports the death of Dr. Robert Bush McGraw, Clinical Professor of Psychiatry and for thirty years Chief of the Vanderbilt Clinic, Psychiatric Clinic. Dr. McGraw was associated personally with the late Dr. Thomas Salmon and joined with Dr. George Draper to organize the Constitution Clinic. His initial work in this clinic constituted the beginnings of psychosomatic medicine at the Columbia-Presbyterian Medical Center and his consultations on the services of the Medical Center mark the beginnings of the psychiatric service of the Presbyterian Hospital. It was from his urgings that the psychiatric service for children evolved. During the late war, Dr. McGraw was responsible for the development of a teaching center for military psychiatrists in the Vanderbilt Clinic. His constant interest and devotion to the growth of the department, his gentleness and kindness towards all with whom he was associated will be long remembered. His friends and admirers have expressed their esteem for him by establishing a fund in the department for teaching and research.

Again this year the department pays its respects and offers its good wishes to those members of the faculty who have left our department to assume positions of importance in the teaching of psychiatry in other universities. Dr. Virginia Wilking has accepted the position of Professor of Psychiatry and Director of the Children's Services at the Seton Hall College of Medicine and Dentistry. Dr. Richard S. Ward has become Professor of Child Psychiatry at Emory University, Atlanta, Georgia, and Dr. Raymond Sobel was appointed Associate Professor of Psychiatry and Director of Child Psychiatry at the University of Washington School of Medicine. Drs. Charles Hogan and William Brooks accepted positions as Assistant Clinical Professors of Psychiatry at the Albert Einstein College of Medicine.

This past year Dr. Charles Socarides has joined the department with the rank of Associate, and

Drs. Terry C. Rodgers, Victor Goldin, Robert Shapiro, Burton August, David Jaffe, Leonard Moss, Martin Barad, Raymond Raskin, James Ryan, Morton Aronson, Josef Weissberg, and Donald Kornfeld have joined the academic staff of the department with the rank of Instructor.

Services to Patients

The expansion of psychiatric services to patients within the Medical Center has proceeded vigorously since these services were established seven years ago. This year marked another landmark with the opening of the beautiful closed psychiatric unit on the twelfth floor of the Neurological Institute. The first patients were received in this unit on March 16, 1960. The service operates under the direction of the Department of Psychiatry with patients referred by attending physicians of this department and the Departments of Neurology and Neurological Surgery. The department was fortunate in obtaining as the head nurse for this service Miss Marilyn Truitt. The opening of this floor now completes the needed services for psychiatric patients within the Medical Center, and probably represents a continuum of services without parallel elsewhere in this country. The extent of the growth of the psychiatric services may best be presented in the form of the statistical summary available for this year compared to the year 1955.

	1955	1960
Vanderbilt Clinic — Visits	4,251	7,861
Inpatient Consultation	595	3,246
Doctors' Private Practice		
Offices — Visits	0	2,643
Neurological 12 — Patients		
Admitted	0	212

The expansion of the Vanderbilt Psychiatric Clinic has proceeded at an unprecedented rate under the contract with the New York City Community Mental Health Board. Dr. Roger A. MacKinnon has been appointed Chief of Clinic,

with the rank of Assistant Clinical Professor. He is assisted by Drs. Elizabeth B. Davis, Bernard Schoenberg and Weissberg as Instructors. The expansion of social work and psychological facilities have provided more thorough and effective management of our psychiatric patients, and afford additional opportunities to our residents to learn from allied disciplines.

With the invaluable assistance of Dr. Joseph E. Snyder, Director of Vanderbilt Clinic and Assistant Vice President, Presbyterian Hospital, the first formal evening psychiatric facility has been established in the Vanderbilt Clinic. Patients can now continue their treatment in the evenings and may thereby resume a useful role in the community more rapidly than was previously possible.

Arrangements have been made with Dr. Stanley E. Bradley, Bard Professor of Medicine and Director of the Medical Service, and Dr. Snyder to have carefully selected psychiatric patients admitted for observation to the overnight ward. The criteria for admission would be essentially the same as for medical and surgical patients. This will provide another valuable psychiatric service for the community.

The reorganization of the inpatient consultation service, initiated July, 1958, has continued. There are now six senior staff members serving as rotating chiefs of service for two-month intervals.

Teaching

With the completion of The Behavior Laboratory on the Psychiatric Institute and the installation therein of closed circuit television equipment, a new era has opened in the teaching and research in psychiatry. This powerful audiovisual aid makes possible the recording of all aspects of behavior, whether during diagnostic processes, treatment situations or the fixed sequences of an investigative program. The closed circuit television installed in the laboratory, provides a split screen exposure so that simultaneous definition may be obtained of overt human behavior and the physiological activity of various organs.

For the first time, the Chairman of the department with Professors George E. Daniels, William A. Horwitz and MacKinnon met with the directors of the State Hospitals affiliated with the

department in psychiatric training programs for residents of these institutions. Through these meetings, significant improvements have been made in the training program. A brochure is to be prepared describing the program, jointly sponsored by the New York State Department of Mental Hygiene and Columbia University.

During the past year there have been several changes in the instructional program of the residents affiliated from the Kingsbridge Veterans Administration Hospital. The valuable assistance of Drs. Zira DeFries, Eugene Forster, Davis and Weissberg make it possible to provide one supervisor for each two residents.

The responsibilities involving the direction of the teaching program of the student nurses has been assumed by Dr. Schoenberg. Dr. Schoenberg conducts a seminar with the first year nursing faculty to implement the teaching of psychological aspects of patient care. Dr. Morris Zelditch, Jr., Assistant Professor of Sociology at Columbia University, and Mr. Jay Schulman participate in these seminars which replace several first year lecture courses.

Dr. Davis has accepted the chairmanship of the Committee on Education of Related Professions succeeding Dr. William R. Watson, who resigned. It is the plan of this committee to review the programs for teaching psychiatry to the related disciplines, which include dentistry; nursing, clinical psychology, theology, occupational therapy and physical therapy and to mobilize the resources of the Department of Psychiatry for teaching members of these disciplines.

At the Mount Sinai Hospital a new program was established under the leadership of Professor M. Ralph Kaufman, for the teaching of basic psychiatry to general practitioners. In evaluating the program at the end of the year it is considered that it may well serve as a pattern for the training of general physicians for treatment of the emotionally disturbed.

Teaching activities of the Sociology Division have been expanded since the last report. Thus from the fall sessions of 1959 to the spring session of 1960, four sociologists participated in a course entitled Psychosocial Aspects of Nursing Care for first year nursing students. Professor Zelditch and Mr. Schulman also took part in a seminar for the nursing instructors.

Psychoanalytic Clinic

The end of the calendar year represents the conclusion of fifteen years of operation of the Columbia University Psychoanalytic Clinic. These years have seen the clinic firmly established as the pioneer of University-sponsored psychoanalytic education in the United States.

Research, an important activity of the clinic from its inception, over the last three-and-a-half years has been more fully related to its training and teaching activities. The clinic is beginning to tap the resources of 1,500 completed psychoanalytic records and concerted efforts have been made to interest candidates in research as part of their training.

In addition to serving the public through its clinical facilities, clinic faculty and graduates are making a substantial contribution to the teaching of medical students and psychiatric residents at this Medical Center and the local State hospitals. This teaching has served as a pattern for similar programs elsewhere.

Clinical Psychology

In the past year the Division of Clinical Psychology has further consolidated its program in the areas of teaching, training, service and research. As part of the expanded service program in clinical psychology, a new position was created for a psychological counsellor in the Department of Physical Medicine and Rehabilitation. In addition, a psychologist and psychometrist have been assigned to a comprehensive research project into the causes of neurological and sensory abnormalities in children.

The intern training program inaugurated three years ago within the broad area of medical psychology, and now approved by the American Psychological Association, has received increased support as well as a fourth year of extension from the National Institute of Mental Health, United States Public Health Service.

Research

Professor Hilde Bruch has pursued her interests in language, body concept formation and disturbances in learning. Professor James Cattell and Dr. Forster have now summarized data on 110 patients first seen in the Vanderbilt Clinic in

October 1958. Information on thirty-six clinical points has been summarized and tabulated for each patient. There are now preliminary answers to the questions posed initially concerning what kind of person with what kind of complaints attends the clinic, and what changes occur in his illness and functioning, and how these changes are related to the treatment facilities of the clinic. Dr. Cattell has continued his work with Dr. Carlos J. Dalmau, Research Associate in Psychiatry (Dental and Oral Surgery), studying the emotional aspects of idiopathic oral symptoms. Dr. Cattell also pursues his work in collaboration with Dr. Paul H. Hoch and Dr. Margaret O. Strahl in their long-range study of pseudoneurotic schizophrenia.

The preliminary phase of research on adolescent friendships of schizophrenics had been completed by Mr. Raymond Pitt, sociologist, and Dr. Kornfeld. It has been found that the nature and complexity of adolescent interpersonal relationships are correlated with length of hospitalization of schizophrenic patients. Mr. Schulman has completed the initial phase of a project on the fate of innovations in the Psychiatric Institute and the Psychiatric Service of the Presbyterian Hospital, and is now analyzing his material.

Dr. Schoenberg and Professor Arthur Carr, assisted by several of the residents, continue to evaluate the criteria for treatment with brief psychotherapy for patients with neurodermatitis. Dr. Schoenberg and Mr. Schulman, together with members of the nursing faculty, are engaged in a project to define certain aspects of the learning process in the first year of nurses' training.

Dr. David Sobel completed his studies on the influence of electro shock and insulin coma, chlorpromazine and reserpine on the fetus when such therapies are administered to pregnant women, and that on the incidence of infant mortality and malformation in children of schizophrenic women. In the first study it was found that electric-shock does not increase fetal mortality or morbidity. Insulin coma therapy was related to significant fetal damage in thirty-five per cent of the cases treated. Chlorpromazine treatment does not raise the incidence of fetal mortality or morbidity when administered to pregnant women. The evidence suggests however that the newborn may suffer severe respiratory depression

of daily dosages of 500 mg. or more of chlorpromazine are given during the latter part of pregnancy. In the second study the evidence suggests that children of schizophrenic women have a higher infant mortality and malformation rate than infants born to the general population.

Currently Dr. Sobel is observing parental activities which stimulates an active pleasurable "mood" in the infant with focus particularly on the way such variations in such parental activities influence early affective development. Dr. John Price is assisting in this work. In another project, data is being collected on body image problems in a group of children with surgically corrected cleft palates and harelips who have persistent speech problems. This study is conducted in collaboration with Dr. George F. Crikelair, Professor of Clinical Surgery and Attending Surgeon. Two psychiatry residents, Dr. Robert Coddington and Dr. Lawrence J. Cassard, are assisting.

In the laboratory, Dr. Joseph Schachter has initiated the collection of normative data on neonates, including measures of gross physical activity and reactivity, digital vascular resistance, and digital arterial pressure. Thomas Williams, a medical student on leave from the College, has been awarded a United States Public Health Service research grant to study vascular reactivity in the neonate.

In the Division of Community Psychiatry a preliminary study was begun for a three-year investigation to be undertaken into psychogenic female infertility in relation to adoption, of which Professor Viola W. Bernard is principal investigator and Dr. Howard R. Stanton is project director. Also David Sanders participated in the new project evaluating the continuous care of schizophrenic patients, a research project under the direction of Professor Ernest Greenberg which grew out of the initial findings of the Columbia-Washington Heights Community Mental Health Project. One of the trainees, Dr. Robert Silbert, is also assigned to this project as part of his field placement training; and one of the recent graduates, Dr. Lonnie MacDonald joined the staff of this project.

Professors William N. Thetford and Carr with the assistance of Mrs. Constance Katzenstein have completed a preliminary study in the area of body image. The chief aims of this study were to

determine the degree of satisfaction or dissatisfaction of patients with their various body parts, and to investigate the nature and degree of body image distortions present. Professor Thetford in collaboration with Dr. Helen Schucman, Senior Research Psychologist with the Child Development Program, has completed a preliminary study comparing the subtest performance on the Weschler Intelligence Scales of patient groups differing primarily in overt system. This study, based on forty-six conversion hysteric patients, has provided results which are consistent with theoretical expectations.

At the Psychoanalytic Clinic, Professor Henrietta B. Klein continued her study of changes occurring in patients during and after psychoanalytic treatment. Professor Klein's comparative study on trainees and their development during the training period in the Columbia University Psychoanalytic Clinic has yielded information which is of value in the selection of trainees.

Another project, concerned with a review of a previous follow-up study of fourteen schizophrenic children (from the New York State Psychiatric Institute), was begun by Professor Klein this year. An attempt is to be made to study the eventual course of the illness of these children, through follow-up interviews during the year.

Professor Aaron Karush, with B. Ruth Easser, Arnold Cooper, and Bluma Swerdloff, working on the "Ego Strength" project have defined the principal factors that make up ego strength and have constructed a scale of balances which, when graphed, forms a curve which should prove a useful instrument for prediction of the outcome of psychoanalytic treatment and psychotherapy.

Professor George S. Goldman, with Daniel Shapiro and Alvin Polatin, is continuing his projects on the effect of group interviews in psychoanalytic and psychotherapy patients and the impact of group interviews on the teaching process. Preliminary impressions suggest that interviews before a group of student-therapists may have a useful, constructive effect on the course of the patient's treatment.

Professor John J. Huber with Dr. Jack Elinson, Associate Professor of Administrative Medicine, have worked extensively on the project they initiated in the fall of 1959, with the objective of setting up an electronic machine coding system

which can be applied to the valuable existing collection of patient records at the clinic.

Drs. Willard Gaylin, Herbert Hendin, Harold Marcus and Kenneth Altshuler, have continued their research on the brief psychotherapy of homosexuality. Dr. Swerdloff completed her work on the predictive value of the admission interview related to changes in the patient and his situation, which has been printed privately by Dr. Swerdloff and the psychoanalytic clinic.

Professor Leon Moses is completing the initial phase of his psychosomatic investigations of the last ten years. The three main features of this investigation have been the development of an adaptational field conceptual system for psychosomatic causality, the development of a definitive psychoanalytic and physiological research technique for the study of individual disorders, and the comparative psychoanalytic, psychodynamic study of five of the major psychosomatic disorders peptic ulcer, ulcerative colitis, obesity, migraine, and essential hypertension.

The mental phase of a follow-up study of ulcerative colitis patients who were treated psychotherapeutically at the psychoanalytic clinic, the psychosomatic clinic, or the ulcerative clinic at the Presbyterian Hospital, undertaken by Professors Daniels, Moses, Karush and John O'Connor is nearing completion. Twelve of the sixty-one patients studied have died but only three deaths were associated directly with ulcerative colitis while eight of the deaths were from other causes, such as liver disease, tuberculosis and cancer. Reviewing the effects of psychotherapy on the course of each individual case of ulcerative colitis, it would appear that it has a definitive and favorable effect. In a rather gross evaluation, about sixty to seventy per cent of the cases show from moderate to excellent responses to psychotherapy. Currently, the project team is dealing with the relationship between initial psychiatric diagnoses and the eventual outcome of the disease.

New York State Psychiatric Institute

Professor Franz Kallmann is engaged in a new study dealing with the changing mating and fertility patterns in schizophrenic families. The main objectives of the study were seen in evaluating the changes in the reproductive rates of

schizophrenics during the last twenty-five years under the impact of modern treatment and rehabilitation procedures, and obtaining adequate data for estimating the consequences of these changes in terms of future prevalence rates.

In an investigation aimed at the early detection of affected members in Huntington's Chorea families, the collection of data on a small series of affected individuals with their immediate family members and a normal control population was completed.

A reanalysis of the effects of various types of psychiatric treatments on two psychophysiological measures, the flicker fusion threshold and the choice reaction time, was completed by Professor Carney Landis and his co-workers. Data collected in six separate investigations since 1948, on a total of 250 hospitalized psychiatric patients, were pooled and analyzed for the differential effects of five different treatments, i.e., psychosurgery, electroconvulsive therapy, insulin-coma therapy, treatment with phenothiazine derivatives, and psychotherapy and/or routine hospital care.

Professor Carr has continued participation in studies on sets of identical twins with divergent sexual development with Professors Lawrence C. Kolb, John D. Rainer and Dr. A. M. Mesnikoff.

Drs. Jacques Rutschmann and Donald J. Dillon have participated in a research project concerned with the clinical and psychological effects of oxygen deprivation. Currently, the sensitivity of a critical flicker-fusion test to effects of anoxia is under analysis.

With the aid of his procedure for three-phase counter-current fractionation, Professor Herbert L. Meltzer continued his study of gangliosides from normal human brains and from brains of patients with Tay-Sachs disease. Further evidence was obtained for the presence of an abnormally large amount of a fraction with a high content of glucose in Tay-Sachs brains. Professor Benjamin Weiss succeeded in synthesizing DL-serine-2, 3- H^3 and several long-chain fatty acid amides of amino acids, and he accomplished several steps in the total synthesis of sphingosine labeled with C^{14} in carbon atoms 1, 2, or 3. Professor George Alexander studied the biogenesis of choline. His results, which appear to provide an explanation of a long-standing uncertainty,

indicate that one-third of each of the three methyl groups of choline is derived from exogenous methionine and that the remaining two-thirds are synthesized *de novo* from serine or formate via adenosylmethionine.

As in previous years Professor Heinrich Waelsch and his research group have been concerned with the study of protein and amino acid metabolism of the brain, and with an investigation of the enzymatically catalyzed incorporation of amines into proteins. The rejuvenation of cholinesterases in peripheral nerve, after irreversible inhibition with an organo-phosphorous compound, have been studied in some detail by Professor Waelsch with Dr. Doris Clouet. It was found that the enzyme recovers in the sciatic nerve of the frog in distal-proximal direction. This finding is of particular interest in relation to the hypothesis of the origin of axoplasmic components in the cell bodies of the neurons by axonal flow. Another area of study has been the metabolism in brain of glutamic acid and its metabolic derivatives with the aid of C^{14} labeled amino acids and N^{15} ammonia examined by Drs. Donald D. Clarke, Sol Berl and Abel L. Lajtha. It was found that the conversion of glutamic acid to glutamine is a metabolic event which occurs in compartments within the cell. Similarly, evidence has been obtained which suggests that the synthesis of glutathione as well as the formation of β -aminobutyric acid is compartmentalized in the nervous tissue. The study of the enzyme, transglutaminase, which catalyzes the incorporation of amines into proteins has been investigated intensively during the last year by Drs. George Acs and Amos Neidle. They have synthesized a number of small glutamine peptides which act as substrates of transglutaminase activity. The availability of such peptides makes the study of the properties of substrates for transglutaminase possible. With Dr. Mary J. Mycek, the action of transglutaminase as an enzyme catalyzing the deamidation of protein amide groups, has been studied in detail. The metabolic ability of protein amide groups under the action of transglutaminase points to a new source of tissue ammonia hitherto not considered. Finally the exchange of amino acids between brain and blood has been investigated by Professor Lajtha in order to define more closely the action of the blood brain barrier

in maintaining the concentration of free amino acids in the nervous system in immature and mature brains. It has been found that the concentration of the amino acids in the brain influences the rate of exchange. A high blood concentration of some amino acids does not interfere with the pumping out of unphysiological high levels of amino acids within the brain.

The short and long term effects of neuropsychotropic agents upon the central nervous system and viscera are under investigation by Professors Leon Roizin and Mavis A. Kaufman, and Drs. Bruce Casselman and Bruno Miles. The aims of these investigations are to determine the effect of acute and chronic administration of these agents on animal behavior, the delineation of their sites and mechanism of action in the nervous tissue, and the determination of the incidence and pathologic significance of toxic effects in human and experimental animals. Experimental investigations of the long term effects of chlorpromazine in rats and monkeys showed histologic changes in the liver, testis, kidney, spleen and central nervous system mainly after toxic doses. Definite conclusions concerning characteristic neuropathologic alterations as the basis for the observed neurological complications cannot be drawn from the cases reported in the literature (three cases) or from the nineteen cases examined at the Institute since their number is small when compared to the number of discussed complications and since these cases appear to be associated with other pathological processes which could have conceivably masked or intensified whatever changes were present. However, some structural alterations of the basal ganglia, hypothalamic and mesencephalic cellular components observed in some of the human cases may possibly be the result of a neurotropic activity of the studied neuropsychotropic agents. The above studies were carried out by Professor Roizin in cooperation with Professor Gedeon Eros and Doctors Reuben Cares, William English, Naftuli Levine and Frederick Weinberg.

In another experimental pathologic study albino rats were maintained on a synthetic diet containing 0.2% methionine for the purpose of inducing chronic liver damage. This liver damage is characterized principally by focal and diffuse necrobiotic changes. These animal preparations

were made to establish if experimentally induced liver damage has any effects on the pharmacodynamic properties of the phenothiazine group of drugs to be administered in later series of animals. This study is conducted by Professors Roizin and Shervert H. Frazier and with the technical assistance of Mrs. Ruth Harris.

Drs. Hirokazu Asao and M. Berger-Wechsler in this laboratory continued to examine the induction of the allergic encephalomyelitis with brain fractions composed principally of mitochondria. As an additional control a liver fraction was used containing principally mitochondria (both emulsions were prepared in the same manner and used in the same quantities). Of a group of guinea pigs which were injected with the brain mitochondria fraction, a majority developed neurological symptoms, while another group injected with liver mitochondria fraction failed to show neurological symptoms.

Comparative histologic, histochemical and electron microscopic studies of the extrapyramidal system in experimental animals and humans are being carried out by Professor Roizin and staff. With the aid of Dr. J. Lawrence Pool, Professor of Neurological Surgery and Director of the Neurological Surgery Service and Dr. Edgar M. Housepian, Instructor in Neurological Surgery and Assistant Neurological Surgeon, biopsies from basal ganglia and cerebral cortex have been obtained for correlated electron microscope, histologic and some histochemical investigations.

Professor Frazier is examining the effects of cerebral hypoxia on behavior in the various classes of mentally sick patients. The purpose of these studies is to attempt to develop clinical tests which will be sensitive to deterioration under anoxic stress.

Professor Sidney Malitz and his associates, Dr. Bernard Wilkens and Dr. Harold Esccover have continued their psychopharmacologic investigations. Their interest has been broadened to include not only pilot screening of selected new drugs but studies of the impact of these drugs on individual patients over extended periods both in and out of the hospital. Emphasis has thus been shifted from the drug to the patient and his total life adaptation. Dr. Stanley Budner has also assisted in this project through the construction of

post-hospital adjustment scales and other predictive rating measures. Professor Malitz with Drs. Esccover, Wilkens and Budner are also studying the relationship between behavior change induced by tranquilizing agents and cerebral functioning through the use of EEG techniques. In addition, they are examining the relationship between the selection process in treatment, clinical improvement and certain social and personality factors, through the use of a battery of psychological tests and questionnaires. Motion pictures of patients receiving therapeutic and hallucinogenic drugs have been made. Of particular interest has been the filming of the effects of LSD-25 and psilocybin in one egg twins. Both twins received identical amounts of the same drug at the same time and were observed separately and together. While certain similar drug-specific effects were seen in both, sharp discrepancies in affect and behavior were also observed based on previously observed personality differences in the twins.

Dr. Reginald M. Taylor has continued his research attempting to produce a known biochemical environment in the perfused brain with a "blood" whose composition is predetermined and altered at will.

Professor Murray Glusman has under study the general problem of elucidating the role of the central nervous system in the mediation of such basic and fundamental behavioral responses as flight and fight reactions using the techniques of deep hypothalamic implantation of electrodes for stimulating and ablative effects.

Dr. Lenore M. Kopeloff has extended the study of epilepsy in the monkey to include the testing of many metals by cerebral implantation. While only a small number induced a chronic epileptic state similar to that previously found with alumina cream, several metals found epileptogenic in this species produced a chronic epileptic state in the mouse and rat. The various types of lesions encountered are under investigation. Dr. Joseph G. Chusid of St. Vincent's Hospital collaborated in this study. With the Department of Pharmacology, the immologic specificity of various amine-incorporated proteins is being investigated.

Honors and Special Activities

Dr. Schachter was awarded a five year research

teaching grant by the Foundations' Fund for Research in Psychiatry for the purpose of fostering the installation and teaching of investigation in this area of psychiatric endeavor. Professor M. Ralph Kaufman was elected to the Council of The American Psychiatric Association. Professor Kolb was elected to the American Board of Psychiatry and Neurology and to the position of President-Elect of the New York Society for Clinical Psychiatry. Professor William S. Langford was appointed to the Committee on Child Psychiatry of the American Board of Psychiatry and Neurology and serves as its Vice-Chairman. He was elected President of the American Orthopsychiatric Association and Dr. Soll Goodman was elected as its Secretary. Professor H. Donald Dunton was elected to membership of the Committee on Child Psychiatry of the Group for the Advancement of Psychiatry. Professor Thetford has been appointed as a Consultant to the National Institutes of Health. He has also been appointed and served on the Committee on Orthopsychiatry in Pediatric Settings of the American Orthopsychiatric Association. Dr. Rutschmann now is a member of the National Research Coun-

cil Committee on International Relations in Psychology. In May, 1960, the facilities of the Psychiatric Institute were utilized for field examinations for purposes of certifying Clinical Psychologists by the American Board of Examiners in Professional Psychology. Professors Zubin and Carr served as examiners.

The department remains heavily indebted to those persons and institutions who have provided the splendid encouragement and financial support through their gifts and grants. They are the National Institutes of Mental Health, the Foundations' Fund for Research in Psychiatry, Parkinson's Disease Foundation, Inc., the Schering Company, the National Multiple Sclerosis Society, National Institutes of Health, Department of Health, Education, and Welfare, National Association for Mental Health, William C. Atwater, Ford Foundation, Jack and Beatrice Hunter Welfare League, the National Science Foundation, the American Cancer Society, Parke-Davis Company, the Poole Fund, the United States Army, the Research Foundation for Mental Hygiene and the Atomic Energy Commission.



Public Health and Administrative Medicine

RAY E. TRUSSELL, *DeLamar Professor and Chairman of the Department*

The year 1960 has been characterized in the School of Public Health and Administrative Medicine by continued curriculum development, gratifying results of research on community problems, a beginning swing in emphasis in certain research areas and additional sources of support for students, faculty, education and research.

The student body is as large as in 1959 — a peak year. The reasons for this apparent leveling off are space limitations and a Faculty decision to reduce the size of the group in the hospital administration curriculum by fifty percent, while at the same time raising admission requirements. However, the continued pressure of federal traineeship programs for scarce categories of personnel, the expanding international program of our Institute of Nutrition Sciences, the newly approved program leading to a Doctor of Philosophy degree in administrative medicine, and our current or developing inter-departmental programs, all portend an expanding class size in the immediate future.

Professor Ray E. Trussell has directed a two year study of nonprofit prepayment for hospital care in New York State submitted to the State Departments of Insurance and Health which was released publicly. The key recommendations for community action in hospital planning, use, economy, and standards were implemented by the Governor and the Legislature. The co-director of the study was Professor Frank Van Dyke. Eighteen other full-time and part-time personnel participated in the work. A second report dealing with seven Blue Shield Plans and four independent medical and dental plans is nearing completion. This work has been supported by Josiah Macy, Jr. Foundation funds, a United States Public Health Service grant, contributions from the Plans and other sources.

A three year study of medical care in Puerto Rico has been completed and submitted to Gov-

ernor Munoz for transmission to the Commonwealth Legislature. Professor Trussell and Dr. Guillermo Arbona, Secretary of Health, were co-directors. Dr. Francisco Berio, Miss Maria Cabranes, Mr. Raul Munoz, Mr. Praxedes Norat, and Professors Harold J. Baumgarten, Jr., Jack Elinson, George Rosen, and Van Dyke were the permanent study staff aided by many part-time personnel. The recommendations of the study which by legislative mandate must include a long-range policy to benefit all Puerto Ricans, are expected to bring about some much needed changes.

The Foundation on Employee Health, Medical Care and Welfare and the School jointly conducted a conference last spring on medical and hospital care secured under collective bargaining. This off-the-record session participated in by national industrial, labor and professional leaders explored critical areas of concern to trustees in the use of collectively bargained funds. The conference was so productive that it is being emulated locally by the Foundation and labor and management leaders.

Professor Trussell is Chairman of the Professional Advisory Committee to the Medical and Hospital Care Committee of the Central Trades Council. The two committees are examining the problem areas of overall community policy, hospital performance, and physician reimbursement. Staff assistance to these subcommittees is being provided by School personnel and members of the firm of Martin E. Segal Inc.

The School is also working with the Teamsters Joint Council 16 Labor and Management Committee on Hospital and Medical Care. This committee is carrying on a three phase program. The School has been asked to survey 300 families who have been hospitalized during a stated period. These families are all members of Teamster Union locals and the purpose of the survey is to ascertain their experience with medical and

hospital care, costs, adequacy of health insurance coverage, and standards of care, including an actual medical audit. Mrs. June Ehrlich is responsible for the survey and Dr. Mildred Morehead is directing the medical audit. The second part of the program is being conducted as part of the School's program of Continuation Education. Professor Baumgarten has organized a sixteen session introductory course in hospital organization and administration for management and labor representatives. This course has included studying Montefiore Hospital department by department, meeting with national experts on such subjects as accreditation, costs and capital financing, examination of emergency and night services in two prominent hospitals in the city, and review of study materials provided specifically for this group. On the basis of the survey results and the better acquaintanceship with the field of medical and hospital care, the trustees representing both management and labor expect to work towards a long-range policy as to what their role should be in directing the use of collectively bargained funds for health benefits.

Together with Professor Van Dyke, Professor Trussell is directing a series of studies of medical care provided in New York City. This program has given first attention to ambulatory care. A team of research faculty is currently surveying the situation and designing certain first step projects. This program is supported by the Health Research Council of New York City on a five year basis.

The field of administrative medicine has been given additional recognition through the approval by the Graduate Faculties of a curriculum leading to a Ph.D. degree in Administrative Medicine. A generous grant from the Kellogg Foundation has provided support for implementation of this program. Professor Trussell is Chairman of a committee to develop examination questions for the American Board of Preventive Medicine which will examine physicians who plan to devote full time to the specialty of administrative medicine.

During the past year Professor Trussell terminated his service as part-time Executive Director of the Mayor's Commission on Health Services of New York City, continued membership on the Governing Council of the American Public

Health Association and its committee on Professional Education. He is a member of the Medical Education Advisory Committee of the Kellogg Foundation, the Master Plan Committee of the Hospital Council of Greater New York, board of directors of the Associated Hospital Service of New York, and a joint committee of the American Hospital Association and the United States Public Health Service to develop recommendations and standards for area-wide community planning for health facilities.

An anonymous gift to the School this year has been made for the purpose of assisting students in the field of hospital administration. The generosity and timeliness of this is important to the present members of the class who need assistance and to future recruitment.

Division of Biostatistics

Professor Agnes Berger and Dr. Ruth Gold have been continuing work in large sample theory and its application to problems of survivorship in chronic diseases; in the study of the correlation between mental illness and physical disability; and in a mathematical investigation of problems of prediction and classification with special regard to medical diagnosis and test design. Professor John W. Fertig has continued his collaboration with Dr. Neal W. Chilton on statistical methods in dental research, under a grant from the National Institutes of Health. Professor Fertig and Dr. Khalil El-Kashlan have continued work on methods for assessing the results of repeat experiments.

The division has participated in a great number of consultations to the research workers of the Medical Center, of the New York State and City Health Departments, and of various other community projects. The participation of some of the more advanced trainees in these consultations has been invaluable.

Professor Fertig spent six weeks in South America during the summer under the auspices of the World Health Organization visiting various medical centers and consulting on problems in bioassay. Professor Fertig serves as a member of the National Advisory Committee on Public Health Training, a committee of the United States Public Health Service.

Division of Community Psychiatry

The interdepartmental training programs of psychiatry and administrative and community psychiatry were carried out again this year within the Division of Community Psychiatry along lines that have been reported previously. This is an interdepartmental program with the Department of Psychiatry. Since its initiation in 1956, twenty-eight physicians in various levels of psychiatric training have been enrolled. A number have completed their programs and have accepted important research, teaching, or administrative positions. This program is the only university program currently accredited by the American Psychiatric Association as meeting the academic requirements for those psychiatrists who wish to be certified by the Association as mental hospital administrators.

The faculty has continued to be strengthened by a number of appointments. Mrs. Madeline Lay Earl was appointed Assistant Professor of Administrative Medicine (Psychiatric Social Work). Dr. Howard Stanton, a sociologist, joined the division as a Research Associate appointed in the Department of Psychiatry. Dr. Marvin E. Perkins, newly appointed as the Director of the Community Mental Health Board is working with the division pending faculty appointment.

Progress has been made this year in continuing to integrate the community psychiatry program with other departments of the Medical Center as a whole. Lectures, case conferences and consultations were provided for medical students, psychological internes, public health trainees, psychiatric residents, psychiatrists from New York State hospitals, faculty members, and Presbyterian Hospital house staff, as well as the social services department and training fellows in psychiatry from abroad.

The division staff has continued close cooperation with the Columbia-Washington Heights Community Mental Health Project now in its final year and which has also served as a field placement for two trainees.

Professor Viola Bernard is principal investigator and Dr. Stanton is project director of a preliminary study for a three year investigation to be undertaken into psychogenic female infertility in relation to adoption. Dr. David S.

Sanders has participated in a project, for which Professor Ernest Gruenberg is the principal investigator, dealing with the continuous care of schizophrenic patients. This project is one of several which has developed from the initial activities of the Columbia-Washington Heights Community Mental Health Project. Professor Bernard has continued as co-director of the Columbia-Washington Heights Community Mental Health Project, has been a guest lecturer in the University of Pennsylvania, served as a group leader at the 12th Mental Hospital Institute at Salt Lake City.

Dr. Sanders, in addition to having full responsibility for mental health teaching in the School of Public Health studied psychiatric care and community mental health programs in several European countries on a grant from the Milbank Memorial Fund.

Support for the interdepartmental activities mentioned above comes from the United States Public Health Service, the Grant Foundation and the New York State Department of Mental Hygiene.

Division of Epidemiology

The interest of the division in hypertension and cardiovascular disease is reflected by the continuing cooperative research work with Dr. George A. Perera, Professor of Medicine and Attending Physician, and Professor Morton D. Schweitzer and Dr. Frances Gearing from the School. Their principal concentration of interest is on the distribution of hypertension among relatives of patients with hypertension, a project supported by the United States Public Health Service. A new large scale study of deaths from coronary artery disease in selected health areas of New York City has been undertaken, supported by a grant from the Health Research Council of the City of New York.

The faculty has been strengthened by the appointment of Dr. John T. Fox as Adjunct Professor of Epidemiology. In addition, Drs. Mortimer Harris and Ralph Sikes were promoted to Adjunct Assistant Professors.

The death of Dr. Morris Greenberg is reported with the utmost regret. He was a longtime member of the faculty and prominent scientist in the field of contagious diseases control

and was greatly admired by students and faculty alike.

Professor E. Gurney Clark is on sabbatical leave as of the end of the year and Professor George L. Saiger is acting division head. Professor Clark is studying the teaching of epidemiology in medical schools and schools of Public Health. He is also engaged in large scale study of venereal disease problems in the United States. He is a member of the World Health Organization Expert Advisory Panel on Venereal Diseases, a member of the committee on International Venereal Disease Problems of the Regional Office of the Americas, and a member of the International Union Against Venereal Diseases. Professor Clark has also been medical consultant to the American Social Health Association, Epidemiological Consultant to the Health Information Foundation, Special Consultant to the Venereal Disease program of the United States Public Health Service, and to the training branch of the Communicable Disease Center of the Public Health Service. He served as a Consultant in Epidemiology of the Communicable Disease Section of the World Health Organization during July and August. Professor Saiger was a member of a conference committee on the Prediction of the Length of Life in Human Populations Following Exposure to Ionizing Radiation sponsored by the United States Atomic Energy Commission, Division of Biology and Medicine at Argonne National Laboratory. Professor Schweitzer has been President of the Public Health Association of New York City and Secretary of the Library Committee of the New York Academy of Medicine. Dr. Gearing has been Permanent Executive Secretary to the Epidemiology Planning Committee for Cardiovascular Disease.

Division of Health Education

During the year Professor Rosen participated in the completion of the report on the study of medical care in Puerto Rico. He continued as Director of the American Public Health Association project on social science and public health. This project is now in its third and final year, and will be completed in October, 1961. He completed the first chapter of the Report on the National Conference on Mental Health Teaching in

Schools of Public Health held at Arden House, December, 1959, and continued research on the historical sociology of mental illness under a grant from the National Institute of Mental Health. Major emphasis in this five year study at present is on psychopathology in the social process, particularly as exhibited by groups or in a group context.

In connection with this project, Professor Rosen, during July and August, carried on library studies at the Bibliotheque Nationale in Paris, the Wellcome Medical Historical Museum in London, the Library of the Royal College of Physicians in Edinburgh, the Municipal Library at Sorbonne, France, and visited a number of mental hospitals and other institutions at Gheel, Belgium; Crichton Royal, Dumfries, Scotland; Highcroft Hospital, Birmingham, England; St. John's Hospital, Bruges, Belgium; Charenton, Paris, and others.

Professor Rosen became a member of the Advisory Committee to the Committee on Medical and Hospital Care of the Central Labor Council; accepted an appointment as advisory editor of the Journal of Health and Human Behavior; continued as Special Consultant to the National Institutes of Health and to the Columbia University Press; continued as the editor of the American Journal of Public Health and as the Consultant in Health Education to the Professional Examination Service of the American Public Health Association. He continued also as a member of the Committee on Health Education of the National Health Council and as a member of the Public Health Committee of the New York Heart Association.

Division of Medical Care Administration

Professor Elinson has organized a cooperative multi-purpose household interview survey of health and medical problems in the Washington Heights Health District surrounding the Medical Center. This Master Sample Survey is designed to serve research interests of investigators on the Faculty of Medicine, and of others whose research questions can be answered at least in part by a sample survey of a geographically defined community. Several projects, both within and out of the Columbia-Presbyterian setting are participating in the first series of household inter-

views of 6,000 families. The Master Sample is to be supported for five years by the Health Research Council of New York City as a continuing sample into which questions can be placed without the necessity of re-constructing a new sample.

Professor Elinson has undertaken a study for the Division of Dental Public Health of the United States Public Health Service on the nature of sociopsychological barriers to the use of chairside assistance by practicing dentists. He has completed an interview study of the career orientations of the younger generations of physicians in Puerto Rico as a part of the faculty team cooperative effort in carrying on the overall medical care study in Puerto Rico. He cooperated in developing a study of the attitudes of graduate nurses and nursing students in Puerto Rico with Professor Edward A. Suchman. The results of his study were analyzed and reported by Mrs. Ehrlich. Professor Elinson and Dr. John L. Weber, Assistant Clinical Professor of Psychiatry, have undertaken an exploratory study to ascertain the feasibility and productivity of a method for characterizing patients and the outcome of their treatment at the Columbia Psychoanalytic Clinic. A cooperative program is developing with Dr. Abraham Lilienfeld who is Professor of Epidemiology at Johns Hopkins School of Hygiene and Public Health, and with Dr. Robert R. Henderson, currently director of the Hunterdon Medical Center, in initiating a follow-up of the Hunterdon County study of chronic illness. Professor Elinson has also developed a design for a community based rehabilitation field laboratory to be operated in behalf of the New York State interdepartmental Health and Hospital Council. He served as a member of the Committee on Health Careers of the Community Council of New York; the Research Study Committee of the Council on Community Service and Education of the American Heart Association; and the Technical Advisory Committee of the New York Heart Association. Professor Van Dyke has completed an assignment as full-time Associate Director of the Columbia Studies of Non-profit Prepayment Plans in New York State. He is serving as co-investigator for a series of studies of medical care in New York City supported by the Health Research Council. Professor Van Dyke was active as a consultant to the

United States Senate Subcommittee on Aged and Ageing, and as a consultant to the Commission on Ageing of the State of New Jersey.

Professor Milton Maloney has continued as full-time director of the research unit for the development of methodology for use by the collaborative program of perinatal research of the National Institute of Neurological Diseases and Blindness. Professor Charlotte Muller has participated in the report of the School on nonprofit prepayment plans. Dr. Morehead who joined the staff of the division in May, 1960, has completed her work as a Consultant to the Health Insurance Plan of Greater New York, where she formerly was director of the Quality of Medical Care Studies. Mrs. Ehrlich has been a Consultant to the New York Heart Association on a pilot study concerning the evaluation of the physician education program for the vocational counseling of cardiac patients.

Recent additions to the research staff of the division also include Miss Virginia Brown and Dr. Reinaldo Ferrer as Research Associates. Miss Brown formerly was Associate Administrator of the Palo Alto-Stanford Hospital Medical Center; Dr. Ferrer was formerly Director of the Regionalization Demonstration in Puerto Rico. Both are participating in the studies of ambulatory care services in New York City.

Division of Occupational Medicine

The division faculty has been strengthened by the appointment of Dr. Norris B. Jacobs as Associate Professor of Occupational Medicine, on a fulltime basis, at the beginning of the year. The research activities of the division continue along previously established lines: toxicology and the job performance of the handicapped. The research work is supported by the United States Public Health Service and by the Office of Vocational Rehabilitation of the Department of Health, Education and Welfare.

Division of Parasitology

The widespread teaching activities of the division continue to expand. Twelve medical students and two former residents from Presbyterian Hospital participated in the elective, "Medicine in the Tropics," and spent two to three months in hospitals in Liberia, Panama, and

Surinam. They were afforded an opportunity to study tropical diseases and see foreign, primitive customs and communities.

Dr. Mary Dunn and Professor Harold W. Brown have continued their studies on the effects of the host's endocrine secretions upon helminths. They have recently shown that pregnancy has no demonstrable effect on the pinworm burden of mice. Miss Eileen Pike, a graduate student, Professor Kathleen L. Hussey and Professor Brown are studying biological relationships of the whipworm, *Trichuris trichura*, and its mode of producing anemia. This helminth is harbored by over 350 million persons in the world. Professor Brown with Professor H. C. Hsieh of Kaohsiung Medical School, Taiwan, has studied a number of anthelmintics on patients of that heavily worm-burdened island. They have found that tetrachlorethylene is an excellent drug against the intestinal fluke, *Fasciolopsis Buski*, and a new compound, bephenium hydroxynaphthoate, is specific against the common human hookworm, *Ancylostoma duodenale*, and the round worm, *Ascaris lumbricoides*, which often accompanies it. Professor Hussey has continued her studies on a hyper-parasite of larval trematodes and on the life cycles of trematodes with a group of parasitologists at the University of Michigan Biological Station. All of the above studies have been supported by grants from the National Institutes of Health. Professor Howard B. Shookhoff is engaged in a study with Dr. M. Zaki, a graduate student, on the effectiveness of several antimony compounds against *Schistosoma mansoni* which is prevalent among Puerto Ricans in New York City. Professor Roger Williams continued his extensive studies on the biting midges of Northern Michigan and the intestinal parasites of domestic and wild animals of Bermuda with the financial support of the National Institutes of Health and the University of Michigan.

Interest in medical education, oriented to their own needs, is growing in African countries. Professor Brown participated in discussions in Ethiopia and Liberia concerning their medical and public health educational needs. During the summer he served, for the fourth time, as a consultant to the Taipei Public Health Demonstration Center and as visiting professor at the National Taiwan University Medical School.

He served as a consultant in the development of the preventive medicine teaching program of St. Louis University Medical School and he gave the first lectures in the course. During the past year Professor Brown served as President of the American Society of Parasitologists. Professor Williams served as a member of the Corporation of the Bermuda Biological Station and gave a series of lectures at its research center. Professor Shookhoff was appointed Medical Advisor to the Director of Selective Service of New York State for New York City.

Division of Public Health Practice

Miss Gloria Dammann, Assistant Professor of Nursing, working in the joint program between the School and the Department of Nursing, resigned in June to become Consultant to the State Health Department. She has been replaced by Miss Grace McFadden, Lecturer and Assistant Director of the Bureau of Public Health Nursing of the New York City Department of Health. Mr. William C. Thomas, Jr., Instructor (Political Science), resigned to join the faculty of Skidmore College in June, 1960.

Professor Margaret W. Barnard has continued to be associated with the Columbia Washington Heights Community Mental Health project. Together with Professor Michael Antell she has been active in the initial planning of a joint research project to ascertain the current tuberculosis problem in the Washington Heights Health District at the request of the Upper West Manhattan Neighborhoods Association. The division has also been interested in developing studies on the problems of the aged in the Washington Heights Health District, and is cooperating with local citizen committees and the Department of Health in this work. Professor Barnard has been a consultant to the development of a proposed project in the Astoria Health district where there is a group of 900 persons between sixty and ninety-two years of age, living in one or two person households. A comprehensive health maintenance service is being proposed by Dr. Nicetas Kuo to define the medical problems of such a group and to ascertain whether readily available clinic and home medical service can replace to some extent more costly hospital care. This project is still in the developmental stage.

Division of Sanitary Science

Professor Alvin R. Jacobson continues to serve on the Executive Committee of the Mid-Atlantic States Section of the Air Pollution Control Association. He also continues as author of two monthly columns for Public Works Magazine.

Institute of Nutrition Sciences

The faculty has been strengthened by the appointment of Dr. Oswald A. Roels as Associate Professor. In addition, Professor Elmer Severinghaus has been named Associate Director of the Institute.

An increasing number of students is being accommodated by the Institute which is a new unit of the School. The strong international emphasis of this Institute is intended to meet a deep need for trained personnel in many countries throughout the world, and it is from such countries that students are currently enrolling for the Institute's programs.

Professor William H. Sebrell, Jr., Director of the Institute, has continued studies on the relationship of fats, lipids, and bile salts to atherosclerosis, in collaboration with Dr. Theodore B. Van Itallie, Associate Clinical Professor of Medicine (St. Luke's). Dr. Sami A. Hashin devotes full-time to this program.

Professor Sebrell served as Chairman of the Committee on Protein Malnutrition of the Food and Nutrition Board of the National Research Council and as program committee Chairman of the Fifth International Congress on Nutrition. He gave lectures on nutrition in the Philippines, India and Ceylon and has served as Nutrition Consultant to the World Health Organization, the Food and Agriculture Organization, of United Nations and United Nations Children's Fund.

Professors Sebrell and Severinghaus have completed field work on a one-year project in Haiti, which was an attempt to improve the diets of school children by the fortification of white flour with lysine. The final reporting of this project is scheduled for early 1961. The program of the Institute has been supported by several agencies including the United States Public Health Serv-

ice, the Nutrition Foundation, the Wesson Foundation, the Coca Cola Company, the Whitehall Foundation, and the Archer Daniels Midland Company.

Continuation Education

Interest in the basic hospital administration program continues to grow on a national and international level. The program was reviewed by members of the Faculty of the Staff College in London: University of Saskatchewan in Saskatoon, Canada; the University of Louvain in Belgium; and the Madras University Medical Center in Madras, India. The Navy Department also sent representatives to observe the teaching in the program during the year.

A nine months' program conducted for the Trustees of the Teamster Joint Council 16 Union-Management welfare funds is now in progress. To date the program has dealt primarily with the hospital, its structure, its function, and the problems which the hospital faces in fulfilling its community responsibilities. Such trustees have the responsibility to provide the financing for medical and hospital services for millions of persons in the New York area as well as nationally.

Miss Jane Robertson in addition to her other duties served as the Program Director for the course offered to Directors of Hospital Volunteer Services.

Professor Baumgarten participated in the hospital administration course of the Faculty of Hygiene and Public Health of the University of São Paulo in Brazil as an exchange professor in the joint program conducted by the School of Public Health and Administrative Medicine of Columbia University and the University of São Paulo with the assistance of a grant from the Kellogg Foundation.

The program of continuation education in public health continued its major objective of making available to personnel in official and voluntary health agencies current and pertinent information by providing short term institutes. These institutes, which vary in length from two to five days, are planned for professional people in the voluntary and official health organizations of New York and the adjacent states.



Radiology

WILLIAM B. SEAMAN, *Professor and Chairman of the Department*
Director of Service

The major departmental change during the past year was occasioned by the retirement of three radiological greats, who for many years have caused world-wide attention to be focused on the Columbia-Presbyterian Medical Center and its Radiology Department by their brilliant scholarly achievements, their stimulating teaching, and their warm understanding personalities. Professor John Caffey will be forever known as the father of pediatric roentgenology. He was not only the first to devote himself completely to this specialty, but he has spiritually and professionally fostered many of the physicians in this field today. Similarly the field of radiologic physics in this country owes its inception largely to the indefatigable research and teaching activities of Professor Giocchino Failla and Professor Edith H. Quimby. To radiologists all over the world, these are the names that first occur when radiologic physics is mentioned. While we will all remain the beneficiaries of the wisdom and knowledge which these three have bestowed upon us, we shall, nevertheless, miss their judgment, and human understanding which has been available to us daily for so many years. As might be expected of such active minds, retirement does not mean inactivity but merely a change in locale. Professor Caffey is now Hospital Director and Director of Medical Education of the Children's Hospital in Denver, Colorado, while Professor Failla is avidly pursuing his research at the Argonne National Laboratory in Chicago. Professor Quimby has consented to continue as a Lecturer for a few more years.

The special activities of the department have been oriented to the development of cine radiography from the clinical and technical aspects. It is felt that these techniques will not only provide a method for recording motion, but with the aid of modern electronics, will completely change the face of modern clinical radiology within the next few years. Another development has been the expansion of the role of radiologists in special

procedures, particularly those involving visualization and studies of the various portions of the circulatory system. It is believed that this will permit greater utilization of specialized equipment by more efficient scheduling and will result in improvements in techniques that will lead to greater diagnostic accuracy.

Staff Changes

Professor David H. Baker became the chief of the pediatric radiologic division in Babies Hospital on January 1, 1960, and was joined by Dr. Walter Heimann as his associate on July 1. The Harkness Pavilion section of diagnostic radiology was greatly strengthened by the arrival of Professor Walter G. Lutz in March. Dr. Douglas Potts, formerly of the neuroradiology department of the National Hospital at Queen's Square, London, England, was a valuable addition to the section on neuroradiology. Other additions to the attending staff were Dr. Patricia Tretter in radiotherapy, and Dr. Robert Silbey in diagnostic radiology.

Professor Norah duV. Tapley began a year's leave of absence in October to do radiobiological research at Stanford University. Dr. Preston Leslie left to enter private practice in California, and Dr. Robert Hochstim resigned to work at the South Nassau Community Hospital in Oceanside, Long Island. Mr. Francis de Friess joined the staff of the radiology department at the University of North Carolina as Assistant Professor and head of the section on radiologic physics.

The following new Residents began their duties: Drs. Charles B. Davidson, George H. Drake, Jr., Ira E. Kanter, and Morton A. Meyers. Drs. Silbey, Herbert Goldberg, Norman Leeds, Jeannette Frenster, and Henry Powsner finished their residency training. Dr. William H. Marshall, Jr. spent the year in diagnostic radiology, as an exchange Resident from Stanford University Hospital. Dr. M. S. R. Naidu, from India, was a Visiting Fellow in radiotherapy, and Dr. Mehdi Rashti, from Iran, was a Visiting Fellow in diag-

nostic radiology. Other Visiting Fellows were Drs. S. Ray A. Brinker, and Gerald E. Caplan from the United States Public Health Marine Hospital, Staten Island.

In July, 1960, a special training program in neuroradiology under the direction of Professor Juan M. Taveras was approved by the National Institute of Neurological Diseases and Blindness. This is a two-year program designed to train future teachers and investigators in the field of neuroradiology. Special fellowships are granted by the National Institutes of Health for properly qualified physicians interested in this subject. Dr. Leeds became the first neuroradiology Fellow in April.

Clinical and Research Activities ***Division of Radiotherapy***

The clinical trial of combined radiotherapy and four atmospheres of one hundred per cent oxygen to enhance the radiosensitivity of malignant tumors was initiated in March, after the development of a suitable high pressure tank for this purpose. Approximately fifteen patients have been treated so far, and the preliminary results are promising. Selected patients have been treated with similar time dose relationships without the use of high pressure oxygen in order to provide a partial control and base line study for this project. This project was presented to the American Radium Society meeting in Puerto Rico by Professor William B. Seaman. All of the members of the radiotherapy division are participating in this project. We are especially indebted to Dr. Cyril Sanger, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist, for his stimulation, guidance, and very able collaboration in this project. Professor Sanger is also developing techniques for the measurement of tissue oxygen tensions.

A clinical study of the efficacy of Cytosan in treatment of various types of cancer has been under way for the past year. Fifty patients have been treated with this drug and encouraging results have been noted in certain types of malignant neoplasms, particularly carcinoma of the ovary, endometrium, and breast. This drug is also being used extensively in the treatment of retinoblastomas.

The acquisition of new radioisotope equip-

ment, including a new scintiscanner and a twin tube scintillation detector, has resulted in the initiation of several clinical research studies and an increase in the number of available clinical isotope tests. Among these are the use of radioactive gold and I-131 tagged Rose Bengal of hepatic scanning. Dr. Donald W. Johnson and Dr. Harold L. Atkins are using tagged Paramino-hippuric acid to study renal function in hypertensive patients. Chromium-51 studies in determining red cell survival and total red cell volume were added to the diagnostic isotope procedures, as well as the Schilling test utilizing Cobalt-60 tagged Vitamin B-12. Dr. Atkins with Dr. Harold G. Barker, Associate Professor of Clinical Surgery and Associate Attending Surgeon, have been using I-131 tagged Polyvinylpyrrolidone to study permeability changes of the gastrointestinal mucosa following irradiation.

The study of the effect of combined chemotherapy and radiation in the treatment of retinoblastoma is being continued by Professor Tapley, Dr. George Hyman, Associate in Medicine and Assistant Physician, Dr. Robert Ellsworth, Assistant Ophthalmologist, and Dr. Algernon Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist. Dr. Tretter has also joined this group and will carry on the study during Professor Tapley's absence.

The need for modern radiotherapy equipment and particularly additional supervoltage equipment continues. This will be partially resolved by the intended installation of a cobalt machine as part of the new radiology department in the Neurological Institute. This need has already been accepted as one of the aims of the Columbia-Presbyterian Medical Center development campaign, and preliminary plans for a combined department are being drawn.

Professor Harold W. Jacox continued as an editor of the Radiation Therapy Section of the Year Book of Radiology and associate editor of the journal Radiology. He completed a chapter on the treatment of pulmonary sulcus tumor for a book on the treatment of cancer and allied diseases. He also served as representative to the American Standards Association for the Radiological Society of North America. He has begun a study of the effects of betatron irradiation on cancer of the urinary bladder and is continuing

another on the effects of radiation on normal and abnormal tissues.

Dr. Atkins and Dr. William D. Horrigan have reviewed the cases of locally advanced carcinoma of the breast treated in this institution over the past ten years. Dr. Melvin H. Becker with Dr. Henry C. Frick, II, Assistant Professor of Clinical Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, and Dr. Harold M. Towell, Assistant Clinical Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, are conducting a clinical analysis of cancer of the vulva.

The project begun in 1958 to evaluate the effect of the combination of radiotherapy and chemicals of the atabrine group in the treatment of glioblastomas, under the direction of Dr. Alfred Gellhorn, Professor of Medicine (Delafield) and Attending Physician, Dr. J. Lawrence Pool, Professor of Neurological Surgery and Director of Neurological Surgery, and Dr. Joseph Ransohoff, Associate Professor of Clinical Surgery and Associate Attending Neurological Surgeon, Dr. Daniel Sciarra, Associate Professor of Clinical Neurology and Attending Neurologist, and Professor Taveras has been completed. It was found that in the doses used no benefit resulted from the addition of these drugs.

A special meeting arranged by the American Cancer Society to discuss recent developments in clinical radiobiologic research, held at the University of Wisconsin, was attended by Professors Tapley and Seaman.

Division of Diagnostic Radiology

Professor Taveras is analyzing the factors affecting the incidence of complications from cerebral angiography by evaluating the relationships between the type and quantity of contrast material used and techniques of the procedure relative to the incidence of major complications. This is a long term study involving the review of 4,500 patients who have had cerebral angiography. Professor Taveras and Dr. Edward B. Schlesinger, Assistant Professor of Clinical Neurological Surgery and Attending Neurological Surgeon, are continuing to develop a simple safe screening method for the diagnosis of brain tumors using radioactive isotopes and external counting methods. They have recently designed a multiple

chamber scanning device for rapid simultaneous counting of all areas of the brain.

Dr. Potts is studying subdural air patterns in an attempt to improve the diagnostic accuracy of subdural hematomas and its differentiation from extradural hematomas. Dr. Potts and Professor Taveras are studying the deep venous circulation in patients with deep cerebral tumors. They are interested in finding techniques for improving the diagnostic accuracy of angiography in deep cerebral neoplasms, particularly thalamic tumors. Dr. Potts has also been designing apparatus for autotomographic studies in pneumoencephalography. He has been working with Professor Taveras on a type of pneumoencephalographic chair in which the patient could remain for the entire procedure. The chair could also be used for somersaulting the patient in order to trap air in various portions of the ventricular system.

Dr. Leeds and Professor Taveras are studying the rate and type of circulation in brain tumors and in patients with thrombosis of the intracranial branches of the internal carotid artery in order to detect small lesions more accurately and correlate the histologic and angiographic appearance. Professor Taveras, Drs. Leeds, Potts, and Norman Chase are performing post mortem arteriograms in order to determine the frequency of asymptomatic thrombotic lesions of the extracranial carotid system. Drs. Leeds and Chase are also studying the anatomy of the cerebral vasculature using a plastic mass injection technique. Dr. Chase and Professor Taveras are continuing their studies of tumors of the parasellar region. Dr. Chase and Dr. John Hardie, Assistant in Neurology and Assistant Neurologist in Vanderbilt Clinic, are attempting to determine the relationship between recent lumbar punctures which are followed by unsuccessful pneumoencephalograms and myelograms. Dr. Chase and Professor Taveras are designing a table to be used for simultaneous bi-plane serial stereoscopic angiographic studies. Dr. Chase and Professor Taveras, together with Drs. Leeds and Potts, are studying the vascular changes occurring in 150 cases of temporal lobe tumors in which a vascular stain was not demonstrated.

The postgraduate course in neuroradiology was given for the second time and its attendance by almost 100 physicians attested to its popular-

ity. Professor Taveras was appointed to the Postgraduate Training Committee (Section of Neurology) of the National Institute for Neurological Diseases and Blindness. He lectured to numerous medical societies during the past year.

Professors Josephine Wells and Seaman analyzed the incidence of destructive lesions of the vertebral bodies occurring in patients with rheumatoid disease. Professor Wells and Dr. Charles A. Flood, Associate Professor of Clinical Medicine and Associate Attending Physician, reviewed our experience with malignant disease of the gastric antrum in an attempt to correlate roentgenographic appearance with prognosis. Professor Wells and Dr. Hochstim began a study of benign disease of the gastric antrum. Professor Lutz and Dr. Robert P. T. Reeves are investigating metastatic lesions of the small bowel secondary to primary carcinoma of the lung.

The teaching program in pediatric radiology has been expanded to include daily teaching rounds in both the X-ray department and on the wards for the pediatric house staff, medical students, and attending staff. Professor Baker and Dr. Heimann are studying the bone changes occurring in Cooley's anemia and are also investigating cases of colonic atresia and an unusual form of total anomalous pulmonary venous return.

Professor Kent Ellis with Dr. Beverly C. Morgan, Assistant in Pediatrics and Assistant Pediatrician, and Dr. Joseph Grayzel, Visiting Fellow in Medicine at the Cardiopulmonary Laboratory, is conducting a study of the roentgenographic and clinical findings in corrected transposition of the great vessels. This was also prepared as an exhibit which was shown at the Cincinnati meeting of the Radiological Society of North America. Professor Ellis with Dr. Morgan and Dr. Dorothy H. Andersen, Professor of Pathology (assigned to Pediatrics), Associate Attending Pathologist and Assistant Attending Pediatrician, is also studying transposition of the great vessels. Professor Ellis and Dr. Hochstim have been reviewing the osseous changes associated with the malabsorption syndrome. A study of the osseous changes in the digits of the extremities in monkeys with chronic cyanosis due to surgically created shunts is being conducted by Professor Ellis in association with Dr. David Lehr of the Cardio-

respiratory Laboratory and Dr. James P. Malm, Assistant Professor of Surgery and Assistant Attending Surgeon. The development of percutaneous retrograde aortic catheterization techniques was started by Professor Ellis, Dr. Kanter, and Dr. A. Gregory Jameson, Assistant Professor of Pediatrics and Assistant Attending Radiologist. The radiographic findings in pulmonary sarcoidosis are being analyzed by Professor Ellis and Dr. Gerald A. Renthal.

Professor Ralph Schlaeger and Dr. Albert Grokoest, Assistant Clinical Professor of Medicine and Assistant Attending Physician, have completed a monograph on Still's Disease. Professor Schlaeger continues his studies on the evaluation of intravenous cholangiography and other problems correlating radiological and clinical findings in the gastrointestinal tract.

Professor Gerhart S. Schwarz is continuing to perfect the XVS system of standardized unit-step exposures in radiography and is completing his manuscript for a book on this subject. He and Professor Tovell and Dr. Anthony D'Esopo, Professor of Clinical Obstetrics and Gynecology and Attending Obstetrician and Gynecologist, are studying stress incontinence using cinematographic techniques. He and Professor Roberts Rugh are continuing to study the electroencephalographic changes in animals following irradiation during fetal life.

Dr. Meyer Alpert has been investigating the etiology of multicentric osteogenic sarcoma and morphology of the chick chorioallantoic membrane in collaboration with Dr. Claus W. Jungeblut, Professor of Bacteriology. With the assistance of Dr. Arthur B. Voorhees, Jr., Instructor in Surgery and Assistant Attending Surgeon, he has been studying the arteriographic appearance of bone and soft tissue tumors. He continues to participate in the basic science course in orthopedics which is part of the orthopedic residency training program.

Pylosic muscle hypertrophy in the adult is being studied by Professor Seaman. Professor Seaman, Dr. Jose T. Medina, with Dr. P. Carbojal and Dr. Daniel Baker, Clinical Professor of Otolaryngology and Attending Otolaryngologist, have been evaluating the accuracy of laryngography in the detection of subglottic extension of vocal cord tumors. The data collected thus far indicates that

this adds to the information obtained by endoscopy. This technique is being extended to study laryngeal palsy and supraglottic neoplasms. Professor Seaman and Dr. Leeds have been reviewing the cranial manifestations of fibrous dysplasia in order to more clearly define the roentgenographic diagnostic criteria.

Cardio-vascular Diagnostic Laboratory

The combined angiocardigraphic-cardiac catheterization suite has been located on the third floor of Presbyterian Hospital in the Department of Radiology since the fall of 1959. The cardiac catheterization studies have been under the direction of Professor Jameson, while the roentgenographic activities have been directed by Professor Ellis. Three hundred and thirty-three patients have been studied in this area since September, 1959, which includes 169 angiocardigraphic examinations. In addition, a number of clinical studies of swallowing and the larynx have been done in this room, as well as preliminary studies in the use of cine for the investigation of the gastrointestinal tract. Although this number of patients represents a large increase over the number that could be handled prior to the opening of this laboratory, the backlog of both pediatric and adult patients has not decreased. New patients are appearing faster than they can be scheduled. This is due in part to the recognition by physicians in the community of the Medical Center's successful cardio-vascular surgical program. In addition, it has been found that newborn or very young infants with severe defects previously considered hopeless can now be salvaged. This important new trend in pediatrics has resulted in a sudden increased patient load requiring management on an emergency basis. Thus, there is need for expansion of facilities for both cardiac catheterization and cardio-vascular radiology.

New Equipment

Final plans for the new department of radiology at the Neurological Institute were completed and construction initiated late in the year. In the new department there will be six diagnostic rooms, a new super-voltage Cobalt-60 radiotherapy installation, and adequate space for offices, reading rooms, and teaching activities. Pre-

liminary plans are being considered for a new department of radiotherapy which would consolidate this activity in the region of the betatron. A new X-ray generator was installed in the Harkness diagnostic division and a second one on the third floor of Presbyterian Hospital. The automatic processing with the X-Omat continues to be a distinct improvement over the previous methods, and has been additionally improved recently by converting to a new type of chemical development. The installation of fluorescent lighting on the third floor of Presbyterian Hospital has resulted in a tremendous improvement in the appearance, as well as the efficiency in this area. During the year the technique of cerebral angiography has been improved by the installation of a ceiling mounted tubestand and a device to take stereoscopic lateral views during simultaneous biplane angiography. The latter device was donated by Dr. Lester A. Mount, Associate Professor of Clinical Neurological Surgery and Attending Neurological Surgeon. Improvements in the radiological equipment in the Squier Urological Clinic were initiated. This includes replacement of the X-ray generator and dark room tanks, plus the installation of a third radiographic table which will greatly increase the efficiency and capacity.

Francis Delafield Hospital

Division of Diagnostic Radiology

The diagnostic facilities have been improved by the acquisition of a Sanchez-Perez rapid serialographic device, which was obtained through a grant from the National Institute of Health. Professor Arnold Bachman, and Dr. Kevin Macken, in conjunction with Dr. Wolfgang Ackermann, Associate Visiting Surgeon, are continuing their interest in azygography and internal mammary vein visualization. An exhibit on this subject was presented at a meeting of the American College of Surgery in San Francisco. Dr. Macken and Dr. Elliott F. Osserman, Assistant Professor of Medicine and Assistant Physician, have been studying osteoblastic bone changes in multiple myeloma.

Further investigations on normal and abnormal swallowing mechanisms, as well as the radiographic investigation of laryngo-pharyngeal tumors are being carried on by Professor Bachman.

Special studies on mediastinal visualization have been begun by Dr. Ackermann and Professor Bachman.

Division of Radiotherapy

This past year showed a further increase in the volume of work which was due to a rise in the number of new as well as of old patients. The scintillation counter and recorder using a Thulium source is now being tested clinically to determine the presence of bone metastases. Professor Ruth Guttmann is studying the diagnostic usefulness of the selective uptake of radioactive ferrous citrate by malignant tissues in an attempt to improve the early detection of malignant lesions. Studies on the effect of supervoltage irradiation on inoperable carcinoma of the lung have been concluded and have resulted in evidence that better palliation and survival can be achieved in such patients when treated with supervoltage therapy as compared to orthovoltage therapy.

Radiologic Physics

Mr. Carl B. Braestrup has completed a development of instruments and procedures for more accurate evaluation of the cumulative dose in radiology. He is now beginning a project to determine the physical dosage factors in teletherapy. An extensive study of the entire teletherapy dosage problem is being organized. Appropriate depth measurements will be made to insure the availability of complete isodose charts for standard techniques using present types of sources and equipment. A new cobalt source has been ordered for Delafield Hospital calling for a doubly encapsulated, doubly welded 1.5 cm. diameter 2,000 curie source. In addition, special instruments and procedures are being developed for the more accurate determination of the patient dose during rotating and stationary irradiation techniques. This will include an extension of the previous investigations concerning the transit dose system.

An investigation utilizing I-131 and Hg-203 for the determination of the cerebral circulation time is in progress. The cerebral circulation time is determined by measuring the time difference between the venous and arterial flow peaks.

The installation of the 500 millicurie Cobalt-60 source in the Standardization Laboratory has been completed. This source will be used mainly

for calibration purposes. An automatic pipetting device has been developed and is now being used routinely in the Isotope Laboratory. This device provides for remote multiple loading and permits precise dilution and dispensing of radioactive solutions. Mr. Braestrup continues to give refresher courses in radiation protection and radiation physics at the meetings of the Radiological Society of North America and of the Academy of Dermatology.

Radiobiology

Dr. Anna Goldfeder continued to study the effects of a combination of total body and local tumor irradiation. This study was undertaken to determine whether the radio-sensitivity of tumors grown in isologous hosts can be influenced if the resistance of the host is reduced by irradiation. This developed from previous studies which showed that tumors grown in hosts of origin required more radiation dosage for total destruction than those grown in hybrid animals. Dr. Goldfeder is also carrying on investigations of the time dose relationship. Experiments are also in progress involving the classification of two types of tumors indigenous to the same host regarding their intrinsic properties governing growth rate and metabolic activity. The purpose of this is to detect the specific properties of each tumor type as related to its radio-sensitivity.

Radiological Research Laboratory

A major change has taken place in the Radiological Research Laboratory in that Professors Failla and Quimby retired from Columbia University on June 30, and were appointed Professor Emeriti. Professor Harald H. Rossi assumed direction of the laboratory on July 1.

As described in previous reports, the activities of the Radiological Research Laboratory have been divided between a research project for the Atomic Energy Commission and a program including teaching in various aspects of radiological physics and problems allied with therapeutic radiology and with the medical uses of isotopes.

The research project for the AEC operates under a contract between Columbia University and the AEC, under the direction of Professor Rossi. Research is conducted in three general fields: radiological physics, biophysics and radiobiology.

The work in radiological physics is largely confined to dosimetric problems involving the measurement of absorbed dose of any type ionizing radiation under a variety of exposure conditions encountered in practice and to the determination of quantities related to dosimetry. Biophysical research is primarily concerned with genetic effects in micro-organisms and *drosophila* and studies of the relative biological effectiveness in mammalian cell systems. Radiobiology deals largely with the effects of ionizing radiation on mammals. An abstract of the activities on the AEC contract is given below:

Radiological Physics

The absorbed dose from X-rays of different qualities (30 to 210 kv) has been investigated as a function of distance from the interface of bone and soft tissue. A parallel plate ionization chamber in which one wall is bone equivalent plastic and the other muscle equivalent plastic is filled alternatively with bone equivalent gas and muscle equivalent gas to obtain the dose distribution. Another situation of biological interest which is presently being investigated is the dose distribution in soft tissue near an interface with glass. This distribution is particularly important for tissue culture irradiation as the absorbed dose in the culture may be much larger than that in tissue that is not in contact with glass.

Information as to W , the energy expended by electrons in producing an ion pair, in tissue equivalent gas mixtures is required for the interface dosimetry problem as well as for the rad per roentgen information in homogeneous tissue which was reported previously. The values of W relative to air for two bone equivalent mixtures with the beta ray spectrum of sulfur-35 have been determined by a total absorption method. A new, larger ion chamber has been constructed to contain the beta rays in muscle equivalent mixtures.

Investigation of the variations of ionization current density in air with cavity size in a copper walled chamber is being conducted as a test on cavity chamber theory. A 130 curie cesium-137 source has been obtained for this work. To date, the problem of determining the point of complete ion collection with no multiplication in very small cavities has been the subject of principal interest.

The use of commercially processed film badges for the dosimetry of energetic beta rays has been investigated. It was found that with reasonable care by the processor, dose determinations over a wide range are possible with an accuracy of the order of ten per cent.

In a cooperative experiment with members of the Brookhaven National Laboratory the biological effectiveness of fast neutrons as a function of energy is being investigated in an attempt to shed further light on the relation between biological effectiveness and the energy density in the tracks of ionizing particles. The Columbia group has been primarily involved in the design of the physical aspects of the experiment, the measurement of first collision dose, the measurement of the absorbed dose distribution in irradiated mice, and the measurement of the dose in energy density parameters (LET and Y). With a number of biological results having been obtained, efforts are now being made to establish the correlation between the physical and biological data.

A new approach to the measurement of RBE dose in mixed radiation fields has been designed and an instrument is being built to utilize this approach.

A project has been begun to determine the distribution of energy density in tissues irradiated with Cobalt-60 gamma rays. The study on the statistical fluctuations in energy loss of alpha particles in matter has been completed and is the subject of a thesis which has been accepted by the Columbia Physics Department.

Radiation Biophysics

A program using cells grown in tissue culture as radiobiological indicators has been initiated. HeLa cells (strain S3) were irradiated while sedimented on the bottom of glass and of plastic petri dishes. A difference was obtained in the curves of survival of colony forming ability as a function of exposure dose under these two conditions. The magnitude of the difference is in line with the predictable from the findings of others for the conditions used and can be explained on dosimetric grounds. Cells adjacent to glass receive a higher dose than would be calculated by the usual conversion from roentgens to rads for the quality of radiation employed. The additional dose is provided by short-range electrons

emitted from the glass surface as a result of greater photoelectric absorption of the radiation by glass which has a higher effective atomic number than plastic. Since the plastic (polystyrene) has an effective atomic number close to that of the cells and immersion medium, results of irradiating cells on plastic and in suspension should be comparable.

A detailed study has been made of the two radio-sensitive mutants of *E. coli* strain B reported previously and of a radio-resistant mutant. The mutants differ not only in sensitivity to ultraviolet radiation and X-rays but also in sensitivity to the decay of incorporated radioactive phosphorus and in the effectiveness of post-irradiation treatments in preventing lethality. The differences between the mutants could not be correlated with nuclear multiplicity, DNA content, RNA content or chromatographic profile of DNA. The mutants were indistinguishable from the parent. However, marked differences were found between the abilities of the parent and the radio-sensitive mutants to mutate spontaneously to the radio-resistant form. One radio-sensitive mutant mutated at a markedly reduced rate compared to the rate for the parent while the other radio-sensitive mutant did not seem to mutate at all. These observations have led to the hypothesis that any of these sensitive mutants (the latter) is the result of a loss of genetic material in the parent while the other sensitive mutant is the result of mutation at the same locus which gives the radio-resistant form, but represents another allele. Verification of this hypothesis will depend upon attempts to obtain genetic recombination (sexual mating) between the strains.

A theory of aging based on somatic mutation has been proposed. A consequence of this theory is that lifespan is inversely related to the somatic mutation rate; thus the mutation rate per generation is constant for all the species. An experiment has been designed to test this hypothesis.

A study of the effect of low acute doses of X-radiation on implanted murine mammary adenocarcinoma in mice suggests that tumor growth is stimulated.

Radiobiology

The radiobiological problems under investiga-

tion deal largely with embryonic and fetal effects. This is based upon prior investigations which have revealed the very high radio-sensitivity of the early embryo, particularly. LD/50 levels are being established for embryos of various ages, from the moment of fertilization through organogenesis. The congenital anomalies of particular concern are those of the central nervous system, although a long term study is in progress to determine the effect of embryonic and fetal X-irradiation on subsequent fertility of both male and female. Some of the various projects are the following:

1. Neuropathological study of the brains of rats X-irradiated in utero.
2. Electroencephalographic study of rats X-rayed during early development, the study extending from birth through twelve months of age.
3. A study of possible heterotic effect on the testis in its reaction to X-irradiation at maturity.
4. Organ weight variations in rats following fetal X-irradiation.
5. The congenital effects of high level X-irradiation of the rat testis, carried to the F_2 .
6. X-irradiation effects on the immature gonad, from early pregonad development in the embryo through sexual maturity (two months).

Radioisotope Laboratory

The radioactive isotope laboratory continued to receive and standardize all the radioactive isotopes and dispense them to clinical and research departments. During the past year the total of ninety-seven shipments comprising over 5,000 millicuries were received. The broad license for isotopes issued by the Atomic Energy Commission continued to be administered by the Joint Radioisotope Committee of the Columbia-Presbyterian Medical Center. Professor Rossi is chairman of this committee, and Professors Quimby and Seaman are also members. About 245 applications were processed during the past year.

Teaching and other activities of staff members

The national and international scientific activities of Professor Rossi include the following:

member, Advisory Committee on Ionizing Radiation for the Mayor of the City of New York; member, Isotope Committee, St. Luke's Hospital; member, National Committee on Radiation Protection, and chairman, Subcommittee 4, Heavy Particles (Neutrons, Protons and Heavier); member, Subcommittee 1, Permissible Dose from External Sources and Subcommittee M-3, Standards and Measurement of Absorbed Radiation Dose. Professor Rossi is a member of the main commission of the International Commission on Radiological Units and vice-chairman, Committee III, Measurement of Absorbed Dose; chairman, Committee III-C on Radiobiological Dosimetry and member, Ad Hoc Committee on Radiation Quantities and Units. Professor Rossi is also a member of a Joint Committee on RBE of the International Commission on Radiological Units and the International Commission on Radiological Protection.

In connection with his duties on the main commission of the International Commission on Radiological Units, Professor Rossi attended meetings in London, England, and Geneva, Switzerland and presented a paper.

Professor Quimby continues to be a member of the subcommittee on Graduate Instruction for Work in Biophysics. A course leading to a master's degree in radiologic physics has been completed for the first time. Instruction was offered by Professors Rossi, Quimby, Sergei Feitelberg, Rugh, Seaman and Tapley, and Mr. Braestrup and Dr. William Gross, with the cooperation of other members of the staff.

The course in clinical use of radioactive isotopes under the joint leadership of Professors Quimby and Feitelberg, and with the cooperation of several guest lecturers, continues to be offered twice yearly.

Professor Quimby's course in radiologic physics, offered in the spring term for residents in radiology at hospitals throughout the city and its environs continues to be well attended. In 1960 there were seventy registrants. In the spring of 1960, she gave eight two-hour Saturday afternoon lectures on radiologic physics at the Washington (D. C.) Medical Center, for the benefit of residents in radiology in hospitals in that vicinity. Forty-nine students were enrolled in that course.

Professor Quimby's book on "Safe Handling of Radioactive Isotopes in Medical Practice" was published by MacMillan in February. With Dr. Otto Glasser and Dr. Russell Morgan she is now engaged in a revision of "Physical Foundations of Radiology."

Professor Quimby is a member of the advisory committee on Isotope Distribution of the Atomic Energy Commission, the national committee on Radiation Protection, the Committee on Handling and Disposal of Radioactive Isotopes of the International Commission on Radiological Protection, and of the Commissions on Education and on Radiological Units, Standards and Protection of the American College of Radiology. She is an examiner for the American Board of Radiology, a consultant for various medical groups, and on the editorial advisory boards of the journal RADIOLOGY and CANCER. She is chairman of the Subcommittee of the National Committee on Radiation Protection which has completed a revision of the handbook on Safe Handling of Bodies Containing Radioactive Isotopes. This has now appeared as NBS Handbook sixty-five. She is also a member of Subcommittee M-1 (of the National Committee on Radiation Protection): Standards and Measurements of Radioactivity for Radiological Use.

Professor Rugh was invited to present the "Keynote Lecture" for the Congress on Neurological Effects of Ionizing Radiations at Northwestern University, September 1960.

Dr. Gross has continued his membership on subcommittee M-1 of the National Committee on Radiation Protection and a Consultantship on Subcommittee M-3 of the National Committee on Radiation Protection. He is also a member of Task Group (3) on Measurement of Stopping Power Ratios and Analysis of Present Data.

Acknowledgment

The Department gratefully acknowledges the research grants from the United States Public Health Service, the United Cerebral Palsy Association, the Atomic Energy Commission and the American Cancer Society.

Statistics of Radiological Service — 1960

The annual statistics for both the diagnostic and therapy divisions of the Radiology depart-

ment and comparison with the previous years are presented in the tables below. The mere enumeration of the examinations performed does not accurately reflect the work load of the department since one type of examination may consist of the exposure of only two films and be completed in fifteen minutes, while others require twenty to thirty films, the presence of a radiologist and several hours for completion. For the past nine months a system has been instituted in which each examination is assigned a certain number of units which reflect the time and effort involved in each type of roentgen examination. For example, a chest examination constitutes two work units, an upper gastrointestinal examination eight units, and cerebral arteriography twelve units. For the last six months of 1960, the X-ray department in the Neurological Institute had a total of 25,515 work units as compared to 15,797 in Babies Hospital, although the total numbers of examinations performed in each area were approximately the same.

The total number of examinations performed in the diagnostic division is not significantly different from last year. The number of patients receiving radiotherapy increased by thirty-five although 1,344 fewer treatments were given. This reflects our present treatment policy of giving the

same total dose in the same overall period of time but in fewer fractions. This results in fewer treatments for a given therapeutic session. Experimental work in animals suggests that such a treatment schedule is probably more efficacious biologically.

The betatron work load is not indicated in the figures below since this facility is shared by both the private and ward service. However, the patient load on the betatron is usually at capacity. A total of 385 patients received 4,676 treatments in 1960 as compared to 4,227 treatments received by 305 patients in 1959.

Diagnostic isotope procedures are carried out by three groups, the routine diagnostic laboratories, the radiation research laboratory under the direction of Dr. Quimby, and the radiotherapy division under Dr. H. Atkins. In the routine diagnostic laboratory 1,082 iodine uptake studies were done; eighty-two in the research laboratory, and eleven more by the radiotherapy group for a total of 1,082. Three hundred twenty-nine thyroid scintiscans were completed by the radiation research laboratory and nine hepatic scans by the therapy division. The radiotherapy group also performed twenty-seven Cr^{51} tagged red cell survival studies.

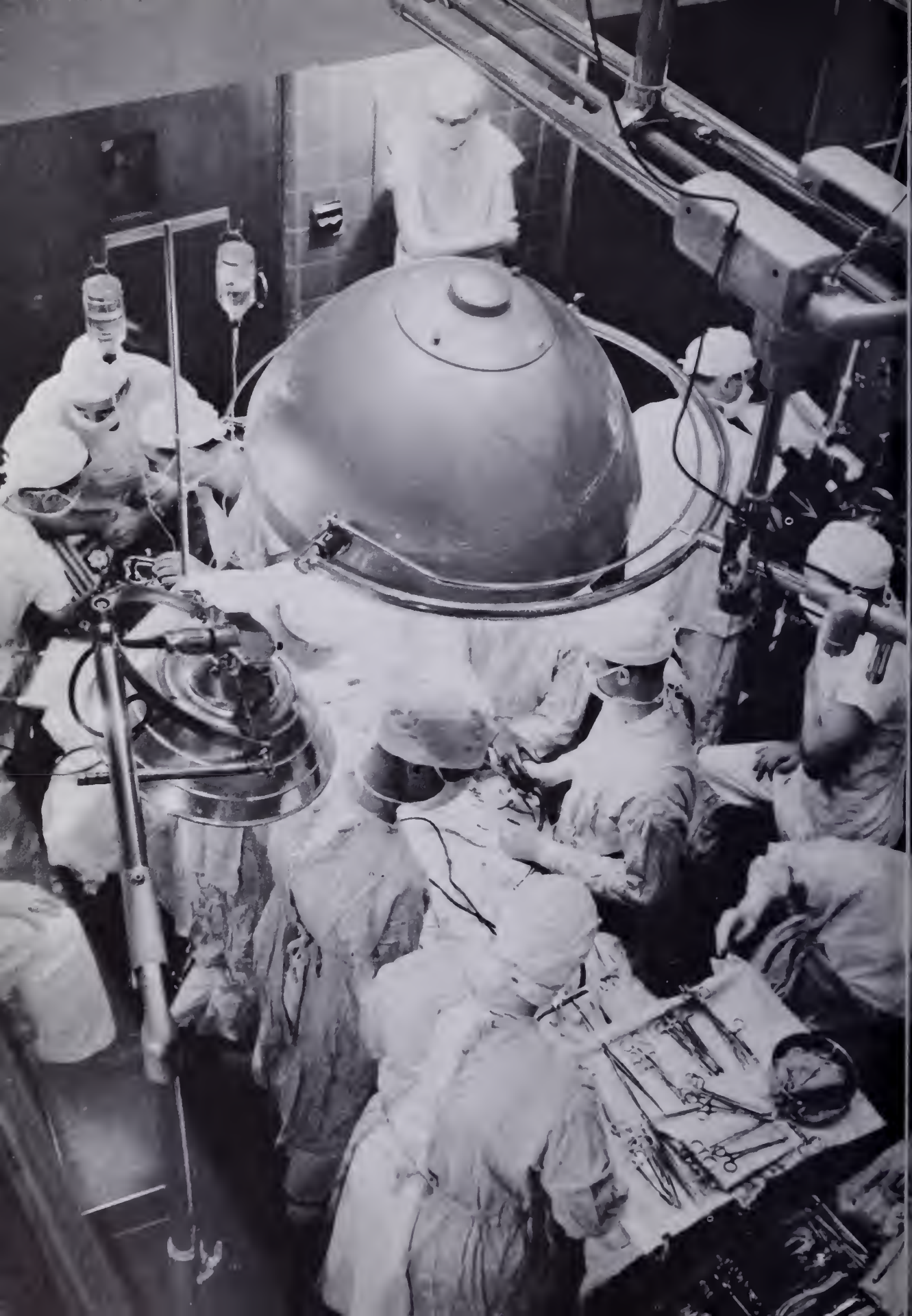
DIAGNOSTIC DIVISION:

	1960		1959	
	<i>Patient Visits</i>	<i>Examinations</i>	<i>Patient Visits</i>	<i>Examinations</i>
Presbyterian Hospital	54,088	61,534	55,524	63,690
Harkness Pavilion	26,554	32,989	25,634	32,119
Neurological Institute	7,285	13,564	6,937	11,579
Babies Hospital	10,473	13,510	10,504	13,455
Urology	5,131	5,394	5,532	5,632
Ophthalmology	647	1,070	709	1,230
Chest Survey	13,436	13,436	14,373	14,373
	<u>117,614</u>	<u>141,497</u>	<u>119,213</u>	<u>142,078</u>

RADIOTHERAPY DIVISION:

	1960		1959	
	<i>Treatments</i>	<i>Patients</i>	<i>Treatments</i>	<i>Patients</i>
Presbyterian Hospital	4,835	489	6,577	521
Harkness Pavilion	6,541	618	4,907	464
Neurological Institute	3,990	190	5,090	211
Ophthalmology	187	27	302	39
Radium ²²²	79	76	70	65
Isotopes (Therapy)	103	68	133	133
	<u>15,735</u>	<u>1,468</u>	<u>17,079</u>	<u>1,433</u>

²²² Includes seven iridium — 192 implants



Surgery

GEORGE H. HUMPHREYS II, *Mott Professor and Chairman of the Department
Director of Service*

Few major changes have occurred within the department during 1960, but steady and substantial gains have been made in clinical and laboratory activities. Improvements in facilities in both areas have made these gains possible. Clinical facilities are now nearly optimal, but great need is still felt in the laboratories for space to accommodate the increasing variety of research that is the proper basis of teaching and progress in patient care. Initiation of the development program by the University and Hospital to answer this need is, therefore, the most significant event of the year.

Staff Changes

This year we lost three members, one through retirement and two through resignation. Four new members were appointed; one Associate Professor, one Assistant Professor and two Instructors.

On July 1, Professor Henry S. F. Cooper retired. Professor Cooper received his M.D. degree "cum laude from Harvard" in 1924. He then came to Presbyterian Hospital as an Intern in Surgery for two years under Dr. Hugh Auchincloss. There followed ten years of service at Bellevue Hospital, first as a full-time "junior adjunct" and then as Assistant Attending Surgeon. In 1937, Professor Cooper returned to the Medical Center and at once took an increasingly active interest in the undergraduate teaching program. During the past fourteen years, he has guided this program with rare patience and understanding. A man of broad and varied interests, perhaps his most notable contribution was his part in establishing at its beginning the high standards of care and teaching at the Mary Imogene Bassett Hospital in Cooperstown which has become an integral part of our undergraduate and resident training program. He continues as a Trustee of that hospital. He continues also his avocation of sculpture, and has given to the department portraits in bronze of the generation which taught

him. On the same date Professor Edward L. Howes resigned to accept the post of Director of Surgical Research at the Hartford Hospital. Dr. Sanford Weissman resigned to enter practice in Connecticut, December 1.

On July 1, Dr. Paul S. Russell was appointed Associate Professor of Surgery assigned to Microbiology and Associate Attending Surgeon. A graduate of the University of Chicago in 1947, Professor Russell served his internship and residency at the Massachusetts General Hospital from 1948 to 1957. From 1951 to 1953 he served in the Air Force, and during 1954 and 1955 he was awarded a postdoctoral research fellowship by the United States Public Health Service, to conduct research under the guidance of Professor P. B. Medawar (a Nobel prize winner in 1960) at the University College in London. From 1957 until he joined the Medical Center staff, he held appointments on the teaching staff of the Harvard Medical School, and the attending staff of the Massachusetts General Hospital. In recognition of his research in tissue specificity and immunologic reactivity in homograft reactions, he was awarded on August 10, 1960, a Senior Research Fellowship by the United States Public Health Service.

Also on July 1, Dr. Luciano Ozzello was appointed Assistant Professor of Surgical Pathology, an appointment held jointly in this department and the Department of Pathology. Professor Ozzello, with a primary interest in tissue culture techniques as a method for study of malignant growth, is closely associated with Professor Margaret R. Murray's laboratory of cell physiology.

The remaining two new appointees are graduates of our own resident program. On January 1, Dr. Francis Symonds was appointed Instructor and Assistant Attending Surgeon at the Presbyterian and Francis Delafield Hospitals. With complete training in general surgery and in plastic surgery, Dr. Symonds is a valuable new member

of the Plastic Surgery Division. On July 1, Dr. Alfred M. Markowitz was appointed Instructor and Assistant Attending Surgeon at the Presbyterian and Francis Delafield Hospitals on completion of his senior residency. He has been awarded an advanced clinical fellowship of the American Cancer Society and is working on a full-time basis with Professor Frederic P. Herter on perfusion methods in cancer chemotherapy.

Teaching

The Division of Surgical Pathology, which has been in the Department of Surgery since its beginning a half century ago, shifted administratively to become an integral part of the Department of Pathology under Professor Donald G. MacKay, July 1. Professor Raffaele Lattes will remain in charge, and he, with Professor Nathan Lane and Professor Ozzello will hold joint appointments. There will be no change in physical organization of the division or in its service function, but the union will bring new strength to the teaching program. The surgical pathologists will take part in the introductory course in pathology, and thus will be better able to integrate that course with the teaching in surgical pathology in the second and third year surgical periods. In addition, residents in pathology will now rotate regularly through the division of surgical pathology, replacing the previous separate appointees. Surgical residents will also continue to rotate through the division, but in their third, instead of first year of training.

With this better coordination in pathology at the second year level, the introductory course in surgery will be able to shift emphasis from a primarily laboratory study of the processes of injury and repair to a greater contact with patients. In order to accomplish this, group units have been reduced in size and increased in number, with a consequent increase in the number of instructors taking part in the course. In this way some of the material now covered in the third year will be presented in the spring of the second, providing the opportunity for instruction at a more advanced level in the third. More teaching time in the curriculum of this year is still an urgent need if the students are to be adequately grounded for their surgical clerkships in the Presbyterian and affiliated hospitals in their final year.

Research

Two new research programs were initiated this year, supported by substantial grants from the National Institutes of Health of the United States Public Health Service. The first of these, under the immediate direction of Dr. Robert Shaw, was begun in the spring. Dr. Shaw has enlisted the enthusiastic cooperation of the Electronics Research Laboratory of the Columbia University School of Engineering and the help of the Bell Telephone Laboratories, in developing an electromagnetic flowmeter for the accurate instantaneous measurement of blood flow through major vessels in experimental animals, and in patients undergoing cardiovascular operations. With the assistance of Dr. Yousif Al-Naaman and Dr. Ali Maksad, operations on dogs have been begun to permit studies of coronary collateral flow, pulmonary flow changes in association with pulmonary hypertension, and changes related to aortic stenosis and defects in the ventricular septum.

The second program was initiated by Professor Russell, following his move from Boston in July, as a continuation of his research there. He is studying tissue specificity, particularly in experiments on endocrine tissue grafting, and on the graft versus host reaction in newborn inbred mice. Studies are continuing in the field of tissue preservation in the frozen state. With Dr. Richard Simmons, experiments have begun to elucidate the mechanism whereby the embryo is shielded from immunologic attack in a project which involves transplantation of placental tissue in early mouse embryos.

A third new program, supported by the Health Research Council of the City of New York, was begun in a newly equipped laboratory at Bellevue Hospital, under the direction of Professors José M. Ferrer and George F. Crikelair. This study of hypothermia in the treatment of burns will be carried out on patients in Bellevue Hospital in conjunction with animal experiments in the departmental laboratories in the College.

Research in cancer is more fully reported in the annual report of the Institute for Cancer Research. Professor Cushman Haagensen's mouse colony continues to be the source of research in the milk factor in mammary carcinoma. Dr.

Michael Heidelberger's immunologic studies continue. Dr. Dan Moore of the Rockefeller Institute has devised methods of concentrating the tumor virus which leave no doubt that the agent can actually be seen in the electron microscope. In association with him, Dr. Etienne Lasfargues, Assistant Professor of Microbiology, in Professor Murray's laboratory of cell physiology, has been able to propagate the agent in tissue culture and to investigate hormonal influences on the growth of normal mammary tissue as well as the activity of the agent in initiating malignancy. This year, for the first time, the same methods are being applied by Professor Ozzello to the study of human mammary tumors. Dr. Murray Bornstein and Mrs. Edith R. Peterson continue their studies on structural development and myelin formation and myelinolysis of nervous tissue from a variety of sources. Enzyme studies in production and maintenance of the myelin sheath and in the "neuralizing" effect of RNA on fibroblasts have been pursued by Dr. Takeshi Yonezawa and Mrs. Helena H. Benitez. A complete bibliography of tissue culture research from 1950 to 1960 is being compiled by Miss Gertrude Kopech.

Dr. Mary Parshley continued her studies of vascular tumors by tissue culture, and initiated studies aimed at isolating a growth inhibitor specific for tumor tissue, with the support of a grant from the National Institutes of Health. Professor Howes continued his work on mucoproteins in relation to cancer, a project he will continue in his new laboratory in Hartford.

In the laboratory of surgical pathology, Professor Lane completed a study, with the help of Dr. Robert Salerno, of the detailed pathologic findings of a personal series of Professor Haagenesen's radical mastectomy patients, exploring the question of early diagnosis in relation to the two main pathologic types. This comprises the first three parts of a study which will be continued in relation to long-term results. With Dr. John Di Re, Professor Lane has been evaluating the histiocytic reaction of lymph nodes, and with Dr. John Ross, the clinical and pathologic features of scirrhous carcinomas with extraordinarily good prognosis are being investigated. Professor Virginia K. Frantz has continued her clinical and pathologic studies of thyroid and other endocrine tumors.

Dr. Robert S. Grinnell who retired as Assistant Professor of Clinical Surgery and Associate Attending Surgeon, is completing his exhaustive study of lymph node metastasis in carcinomas of the colon, and with his assistance, Dr. William V. Healey has initiated a study of the use of radiophosphorus in the detection of various intestinal tumors. Professor Herter has continued his experimental studies of suture line recurrence and has pursued a coordinated study in the laboratory and clinically in the Presbyterian and Delafield Hospitals on chemotherapy of cancer by means of local perfusion. With Dr. Markowitz the use of autogenous bone marrow transplantation and hypothermia to protect against the toxicity of cancerocidal agents was begun as well as the effects of nitrogen mustard and lymph node removal on the transplantation and spread of Brown-Pearce tumors in rabbits.

Professor Thomas V. Santulli continued his clinical investigation of the natural history of tumors in the pediatric age group. In addition he began an experimental study of the pathogenesis of congenital intestinal atresia.

Professor David V. Habif, with Dr. E. Foster Conklin, has continued his studies of lymphedema. This study has been extended to the experimental production of lymphedema in the dog. With Dr. Gabriel Nahas, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist, a study has been initiated in the use of buffer amines in whole blood preservation. With Dr. Charles W. Findlay and Miss Balbina A. Johnson, a clinical evaluation of a new skin antiseptic ("Betadine") was completed which has resulted in the adoption of this substance in the operating rooms at Presbyterian Hospital. Dr. Findlay and Miss Johnson have also continued their studies on hospital-acquired infections with particular emphasis on staphylococcal disease.

In the blood bank, Professor John Scudder, with the assistance of Drs. John Gorman and John Van Peenan, has begun a series of studies on antibody formation in recipients of blood transfusions. A rare "anti-Diego A" antibody was discovered in a patient and made possible an intensive study of this factor in a Puerto Rican family. In addition a study on the gas phase in blood preservation is under way.

In cardiovascular surgery, in addition to the

work of Dr. Shaw described above, Professor James R. Malm is continuing his evaluation of prosthetic replacements within the heart, as well as the physiologic effects of extra-corporeal circulation and, with Dr. William M. Rogers, Assistant Professor of Anatomy, phonocardiographic methods in the diagnosis of congenital heart disease. Dr. Paul Gerst is continuing his studies in pulmonary vascular resistance and pulmonary hypertension. Professor Ferdinand McAllister's experimental studies on factors influencing peripheral atherogenesis and collateral circulation continue.

Different aspects of gastro-intestinal physiology have continued to interest two research laboratories. Professor Robert Hiatt, with Dr. Irving Goodman, Assistant Professor of Biochemistry assigned to Surgery, is currently studying the ileal response to a number of biochemical agents. Using dogs with enervated and denervated ileal segments, the autonomic activity in the small bowel is being investigated. Professor Edmund N. Goodman, with Dr. Henry Colcher, Associate in Medicine and Assistant Physician in Vanderbilt Clinic, and Mr. George Katz, has continued his electro-gastrographic studies. With the assistance of Dr. William B. Seaman, Professor of Radiology and Director of the Radiology Service, cineradiographic demonstration of esophageal motility in normal and abnormal states has been further developed. In addition, a new technique for obtaining colored motion pictures from the lumen of the esophagus and stomach has been developed.

In the surgical metabolic unit, Professor Harold G. Barker, with the assistance of Drs. Frank Gump and Robert Beals, and the collaboration of Dr. Michael J. Lepore, Assistant Clinical Professor of Medicine and Assistant Attending Physician, studies of intestinal absorption of fat and xylose in patients with malabsorption diseases, and in man and experimental animals following resections of stomach or small intestine have continued. In addition, abnormal protein passage across the intestinal mucosa has been measured by radioactive iodine tagged P.V.P., and with the collaboration of members of the Department of Radiology, abnormal permeability after radiation exposure has been studied. Dr. Arnold Mitelman's studies of adrenal steroids, especially in

relation to cirrhosis of the liver are continuing, as are those of Dr. Arthur B. Voorhees, Jr. on ammonia intoxication associated with portacaval shunting.

Dr. John F. Prudden, with the assistance of Dr. Takayui Inoue, a research fellow from Osaka, and the collaboration of Dr. Othman R. Gabriel, Associate in Biochemistry, has been working to purify the active component of cartilage which he has demonstrated to be effective parenterally in accelerating the strength of healing wounds. With the help of Professor Habif and Dr. Archie Dean, Jr., Instructor in Urology and Assistant Urologist, the effect of growth hormone on renal clearance of urea, glucose, alpha amino nitrogen, and creatinine has demonstrated no significant short range effects. In addition a long-term evaluation of celiac ganglionectomy on the clinical course of severe ulcerative colitis is in progress.

The animal operating room has been more active than ever before in its research and teaching functions. Under the direction of Dr. Voorhees, a method has been worked out for cost-charging research projects serviced by departmental personnel, which has permitted employment of additional help and so an augmented usefulness to other departments. During the year, 1,193 operative procedures were carried out by research workers in eight departments in addition to surgery. Much credit must go to Miss Sue Montgomery who supervised the operating room until September 1, when she resigned to accept a position on the west coast. Her place has been taken by Mrs. Elizabeth Wolff, whose responsibilities will be even greater as facilities expand with the construction of the projected research building.

Presbyterian Hospital

A measure of the effectiveness of a teaching hospital surgical service is the variety of types of operations done, and the proportion of teaching service to private operations. The following statistical table shows that, with the total number of operations at an all-time high, a remarkably steady balance has been maintained over the past three years. Completion of renovation of the eighteenth floor operating rooms in the fall of 1959, and the continued use of the newly

equipped operating rooms on the third floor by the Division of Plastic Surgery for in-patient as well as out-patient procedures has made possible a total increase of nearly 1,000 operations. This large volume and wide variety of surgery provides unsurpassed teaching and training opportunities for our students, interns and residents. At the same time, the improved facilities insure the continuation of exemplary patient care which is the foundation of clinical teaching.

Continued support from the John A. Hartford Foundation of the program in open-heart surgery has resulted in increasingly effective activity in this new area, in which the greatest coordination of pediatricians, cardiologists, radiologists, anesthesiologists and surgeons is essential. The new diagnostic laboratory in radiology, under the direction of Dr. A. Gregory Jameson, Assistant Professor of Pediatrics, Assistant Attending Radiologist in Presbyterian Hospital and Associate Visiting Physician at Bellevue Hospital, has come into its own during the year and has proved to be, as anticipated, a vital link between the increasing number of patients who come to us for care, and the advances in understanding and technique which permit an increasing proportion to be cared for surgically. A new type of perfusion apparatus was put into operation in May and has already demonstrated its effectiveness in making these procedures safer. The operative program,

carried out principally by Professor Malm, now permits a regular schedule of two procedures a week. In the after care, the new recovery room, now staffed by a stable group of experienced nurses, is steadily rendering the specialized care which is essential. A total of 372 patient days of care were rendered during the year in this unit.

Our large volume of ward operations is a reflection of the activity of the out-patient clinics. To the steady accretion of new patients is added a mounting load of follow-up visits which is taxing the able services of Miss Gertrude Taylor. Since it has been established that ultimate judgments of surgical procedures can be made only through complete knowledge of long-term results, and since these judgments are especially important in the newer, more complex operations, it is essential that this area of patient service receive increased support. Over 7,300 patient visits were made to this clinic alone during the year.

In the Surgical Pathology laboratory, in addition to examinations of specimens from the experimental surgery laboratories and those sent for consultation service from patients in other hospitals, 10,922 surgical specimens were examined from Presbyterian Hospital patients. Supervision of this large service load is the responsibility of Professor Lattes. As noted above, after this year it will remain in his hands as a function of the Department of Pathology.

PATIENT CARE STATISTICS

TOTAL OPERATIONS	1958	1959	1960
Surgical Service	5,928	6,486	7,434
Per Cent Ward	43%	45%	44%
CLASSIFICATION			
Thyroid	310	357	368
Gastrointestinal	620	651	661
Appendix	164	199	200
Gall Bladder, Pancreas	432	469	510
Hernia	526	555	565
Other Abdominal	461	505	525
Rectal	338	392	403
Thoracic & Cardiovascular	322	357	364
Breast	542	598	612
Plastic			793
Other superficial	1,288	1,169	1,182
Head & Neck			312
Pediatric	683	931	939
RECOVERY ROOM	10,525	10,717	11,196
TRANSFUSIONS	12,626	12,146	13,473

Francis Delafield Hospital

The clinical activity of the surgical service at the Francis Delafield Hospital has continued at a satisfactory volume, comparable to the previous year. There were 5,922 outpatient visits and 855 admissions to the in-patient service. The great variety of neoplastic diseases seen, as well as the opportunity to follow the course of these patients over long periods, offers a unique opportunity for evaluating methods and results in surgery, and for teaching of students and training of residents and fellows.

This year, all third year students have visited the hospital in small groups for well prepared teaching exercises by the staff. In addition, an opportunity, to elect a period of study there, is available in the fourth year. All of the surgical Assistant Residents at Presbyterian Hospital rotate through the Delafield service during their first year, and the residency ends with a six month period as Senior Resident there. National Cancer Institute traineeships and fellowships from the American Cancer Society have permitted a year of cancer training for three or four men each year.

The research program is closely integrated with that of the Institute of Cancer Research at the College of Physicians and Surgeons since all staff members hold joint appointments. These projects are described in the annual report of the Institute, and briefly outlined in the summary of department research presented above.

Bellevue Hospital

During the year, significant improvements were effected in all areas of the First Surgical Division. Clinical activity in wards, operating rooms, and out-patient clinics continued at a satisfactory level. Professor Frederick S. Craig, and Drs. Frederick Randall and Robert T. Potter were appointed to the staff during the year. No resignations or retirements occurred.

Teaching of the third year students and clerkships in the fourth year continued in an augmented fashion, in no small measure due to the energy and enthusiasm of Drs. Ramon de Jesus and Ray Amoury. The program is filled to capacity throughout the year.

As a result of considerable initiative, ingenuity, and hard work on the part of the members of

the house staff, the Lewis Library on the fifth floor of the L & M Pavilion was conceived, prepared and formally dedicated to Professor Kenneth M. Lewis, Sr. on September 24, 1960. The attractiveness of this room has been greatly enhanced through the wholehearted cooperation of the hospital administration, as well as numerous specific contributions by friends, various members of the attending staff and the division secretaries. The library has long been needed as a quiet refuge for study, house staff conferences and, in addition, has served as the setting for a series of informal lectures and seminars by a number of prominent surgeons, including Professor Andrew Wilkinson, Nuffield Professor of Pediatric Surgery at the Hospital for Sick Children in London, Professor Michael E. DeBakey, Chairman of the Department of Surgery at Baylor University, Houston, Professor Francis D. Moore, Moseley Professor of Surgery at Harvard, Professor Oliver Cope of Harvard, Professor David State of Albert Einstein School of Medicine, and Professor Ralph Deterling of Tufts University School of Medicine.

As noted in the section on departmental research, a new research laboratory has been established in the previous operating room area on the fifth floor of the I & K building. The effective work of Dr. John C. Norman, and the splendid cooperation of the hospital administration deserve great credit. Professor Ferrer has obtained equipment and supplies, and a permanent laboratory technician has been employed. Burn studies have not yet been begun, but a variety of other clinical studies are under way, including investigations on the metabolic response to gastric hypothermia, pilot studies on revascularization of the lower extremities in occlusive disease, a technique of prone paracentesis, regional hypothermia in amputations of the leg, and scrotonin studies in acute appendicitis. In addition, serum electrolyte and blood chemistry determinations are performed in this laboratory.

The program of rounds and conferences for the intern and resident staff remains unchanged. The residency program with the first year after internship at Bellevue, two subsequent years at Presbyterian Hospital, and a final year as resident at Bellevue, continues to be a satisfactory arrangement.

Mary Imogene Bassett Hospital

Affiliation with this hospital is a continuing satisfaction. Although scheduling difficulties this year prevented the usual joint meeting of the departmental staff with the Cooperstown group, close and cordial relations are maintained through the regular rotation through the Presbyterian and Delafield Hospitals of one of the assistant residents from Bassett and through the popularity of the fourth year elective clerkship in surgery, which attests the quality of student teaching.

During the past calendar year nineteen fourth-year students elected to take their fourth-year clerkship at the Bassett Hospital. During a period of two to three months, they make daily rounds with members of the staff, present cases in detail in four hourly seminars each week, and attend week's journal club and pathological conferences. In addition to studying three or four new patients weekly, and following each through his preoperative period, the operation, and his postoperative care, arrangements have been made for several students to spend a full day with one of the young general practitioners in an adjacent town, an experience which is mutually profitable.

The new research project in total body irradiation and related tissue and organ transplantation studies, under Dr. Joseph W. Ferrebee, has many surgical facets. This year Dr. John A. Collins was awarded a research fellowship on completion of his internship in Presbyterian Hospital, to work in this project in the field of organ transplantation. He will return to Presbyterian in 1961 as an Assistant Resident; his place will be taken by Dr. Herbert Hechtman, currently a surgical Intern in Presbyterian.

St. Luke's Hospital

The surgical service of St. Luke's Hospital has moved steadily forward in the productivity of its laboratories, and the effectiveness of its teaching program. Of the four affiliated hospitals which offer regular two-month elective clerkships in surgery to our fourth-year students, this year it attracted the most students. From an average of four in each group three years ago, the average has now risen to seven or eight.

Fifteen members of the attending staff, including representatives from anesthesiology, radiol-

ogy, orthopedies, pediatric surgery, as well as general surgery, actively participate in conducting teaching sessions with the students. An active emergency room and out-patient clinic also affords a considerable experience in these areas under the guidance of the senior resident staff. With the larger groups of students more opportunity for group discussion sessions has resulted.

Roosevelt Hospital

During the year of 1960, twenty fourth-year students from the College of Physicians and Surgeons spent thirty-two months working on the Surgical Service at Roosevelt Hospital. Emphasis continues to be placed on active participation of the students in the work on the wards and in the operating rooms. A busy ambulance service, and an emergency department that handles an average of more than one hundred patients daily, insure a large percentage of acute surgical problems. There are two formal teaching sessions weekly, daily ward rounds, and a combined conference each Tuesday that covers interesting cases from each surgical division. Once a week there is a gross surgical pathology conference. A definite effort is made to give the student a feeling of responsibility for his patients and to allow him to follow them before operation, during operation, and during the postoperative period.

Mount Sinai Hospital

With the resignation of Professor Ivan Baronofsky as Chief of the Surgical Service at Mount Sinai on June 30, 1960, the organization of the service at Mount Sinai has been in a phase of transition during the greater part of the year. The residency program has continued unchanged since its reorganization two years ago. Formal teaching is limited to post-graduate courses. It is anticipated that a new director of surgery will be appointed in the coming year and that with this appointment, the teaching potential of this very active service may become more closely related to the department as a whole.

Montefiore Hospital

An active general surgical program, with notable achievements in the cardiovascular field, continues to characterize the surgical service at Montefiore. In peripheral vascular surgery, Pro-

fessor Henry Haimovici, and in cardiac surgery, Dr. George Robinson, continue their active clinical and experimental programs. Dr. Perry Hudson, who left the Francis Delafield Hospital in 1959, has taken charge of the Urological Division. At the graduate level, the internship and residency program continues to attract men of high calibre. A number of medical students from other schools have served elective clinical clerkships in surgery here, but students from the College of Physicians and Surgeons have not, as yet, made use of this opportunity.

Outside Activities:

The most significant meeting held at the Medical Center for an outside group was the combined meeting of the Alumni Associations of the College of Physicians and Surgeons and the various alumni groups of the clinical services. In surgery, as a prelude to this meeting, the Allen O. Whipple Society met at the Medical Center, April 21. In the morning, a spirited discussion by five Deans explored the problems of selection of medical students, after which, the chairmen of the surgical departments of Columbia, Cornell, New York University, and the State University of New York described and compared their undergraduate teaching programs. In the afternoon, training in surgical specialties was discussed by a panel chaired by Professor George H. Humphreys, II, with Professors Edmund P. Fowler (Otolaryngology), Halford Hallock (Orthopedic Surgery), John Lattimer (Urology), J. Lawrence Pool (Neurological Surgery), Howard C. Taylor (Gynecology and Obstetrics) representing the "established" specialties, while Professors Crikelair (Plastic Surgery), Santulli (Pediatric Surgery), Robert H. Wylie (Thoracic Surgery), and Dr. Carl Feind (Head and Neck Surgery) represented "less well-defined" and "emerging" specialties. A report of these discussions will be published.

On the following day, the Alumni of the Surgical Service met. Cases were presented from each of the seven divisions of the surgical service, in the morning. In the afternoon, the annual Thomas W. Stevenson memorial lecture was delivered by Dr. Joseph E. Murray, who spoke on studies on homologous transplantation of skin, bone marrow and kidneys. Over 140 alumni and guests attended.

On November 10 and 11, the Halsted Society met at the Medical Center. After an operative clinic, papers were given on the first day from the departments of New York members. On the second day, papers by out-of-town members were given in the morning, and in the afternoon, a tour of the research laboratories was arranged.

The Gibson lecture series on subjects related to blood banking, begun last year through the sponsorship of the Fenwall Company, was continued. On April 28, Professor R. R. Race, Director of Medical Research Council, Blood Group Research Unit, Lister Institute, London, spoke on blood group and genetics; on May 26, Dr. Walter H. Seegers, Professor and Chairman, Departments of Physiology and Pharmacology, Wayne State University, spoke on recent advances in our knowledge of prothrombin; and on December 8, Dr. James Tullis spoke on many advances in the preparation and use of blood fractions. These lectures are most enlightening to members of the surgical staff and others of the Medical Center community as well as numerous invited guests, in keeping us informed of the many developments in this field that is so intimately linked with surgery.

Other invited speakers included Dr. Börje Ejrup of the Karolinska Institute in Stockholm who, on March 24, spoke on the anti-smoking clinic he organized in Stockholm.

Our research fellowship group has continued to train men who will carry our methods abroad. Dr. Antonio Demetz completed his fellowship in October, and returned to Italy, where he will assist in setting up a program of extra-corporeal circulatory support for open heart surgery. Dr. Al-Naaman was awarded the degree of Doctor of Medical Science for his work with Professor McAllister in the study of factors influencing collateral circulation. He will return to the University of Baghdad in the spring where he will be in charge of thoracic and cardio-vascular surgery. Dr. Maksad of Lebanon will also terminate his fellowship in the spring and plans to join Dr. Al-Naaman in Baghdad. Dr. Ching-Chang Liu, Fellow of the American Bureau for Medical Aid to China, completed his fellowship here in July, and then visited other leading centers of cardiac surgery, prior to returning to the National Defense Medical Center in Taiwan. Dr. Inoue of

Japan is continuing his research with Dr. Prudden, and Dr. Yoshiaki Omura, also of Japan joined Professor Malm's group in the laboratory study of methods in open heart surgery. Dr. Bashir Zikria of Afghanistan is now serving his two year tour of duty as Assistant Resident at the Francis Delafield and Presbyterian Hospitals, after which he will return to Bellevue Hospital for his residency.

The department has also been host to many distinguished foreign visitors. Dr. Jaime Isaza of the faculty of the University of Cali, Colombia visited us for nine months. For shorter periods we were visited by Professor John Bruce, Regius Professor of Surgery at Edinburgh, Professor J. Morelle of Belgium, Professor J. C. Goligher of Leeds, England, Professor A. K. Basu of Calcutta, India, Professor M. A. Hidayat of Cairo, Egypt, Professor Namiva Okada of Wakayama, Japan, Professor Hajime Imanaga of Nagoya, Japan, Dr. Csare Pantoja of Bogota, Colombia, Dr. Nguyen of Saigon, Vietnam, Dr. Charles Saint-Cyr of Martinique, Dr. Roberto Gutierrez of Argentina, and Drs. Ozerova and Melnikov of Russia.

The department was represented at many out-of-town meetings. Notable among these was a speaking tour of Venezuela, Argentina, Chile and Peru made by Professor Haagensen in November and December, and the attendance of Professor Murray at four international meetings concerned with various aspects of cell biology held in Paris and Pallanza. Altogether twenty-six members of the department attended seventy-two out-of-town meetings and gave seventy-five papers. There were sixty-four publications from the department.

Honors and Offices

Professor Frantz was named as President-elect of the American Goiter Association. She also received a citation at the 75th Anniversary of Bryn Mawr for her contributions in surgery. Professor Ferrer was appointed to the executive committee of the New York Academy of Medicine. Professor Habib was made a member of the Committee on Hospital-Physician Relations of the New York County Medical Society. Professor Herbert C. Maier was elected Vice-Chairman of the American Board of Thoracic Surgery and Professor Wylie was elected Chairman of the Ad-

visory Council for Thoracic Surgery of the American College of Surgery and was made a Trustee of the New York Academy of Medicine. Professor Murray was appointed to the Fellowship Review Panel of the National Institutes of Health and to the Council of the American Society for Cell Biology. Professor Edward B. Self was elected President of the Society of the Alumni of Presbyterian Hospital as well as being permanent Chairman of the Alumni Fund Drive for the Class of 1936 of the College of Physicians and Surgeons. Professor Scudder was made an honorary member of the John Andrew Clinical Society after delivering the Sixth Charles Drew Memorial Lecture at Tuskegee. Dr. Grant Sanger was elected President of the Allen O. Whipple Society.

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Fund, the Special Fund held for Dr. St. John, the Special Fund for Open Heart Surgery, the donors to the Surgery Endowment Fund, Parke Davis Company, Tailby-Nason Company, the Health

Research Council of the City of New York and the National Aeronautical and Space Administration.



Urology

JOHN K. LATTIMER, *Professor and Chairman of the Department
Director of Service*

The year 1960 was a period of expansion for the Department of Urology. Professor John K. Lattimer was appointed Chief Urological Consultant to the Kingsbridge Veterans Administration Hospital. A program for exchanging residents with the Kingsbridge Hospital was put into effect, so that their residents could benefit from the pediatric and female urological experience at the Medical Center while the Presbyterian Hospital residents could benefit from the study of paraplegic and tuberculosis patients at the Kingsbridge Hospital. Professor George W. Fish became Professor Emeritus of Clinical Urology on July 1, 1960 and Consultant in Urology to the Presbyterian Hospital as well as Consultant at the Francis Delafield Hospital. Professor Fish is the liaison officer between the American Urological Association and the Armed Forces. He is Consultant to the West Point Military Academy Hospital and is Area Consultant to the Veterans Administration in this region.

Professor Ralph J. Veenema gave up his active position as Chief of Urology at the Valley Hospital in Ridgewood, New Jersey on July 1, 1960 to take over the direction of the Urology Service at the Francis Delafield Hospital. Dr. Dudley Miller, Chief of the Urological Service at the United States Public Health Service Hospital on Staten Island, was appointed to the teaching staff of the Department of Urology and his resident staff started on a fellowship rotation through the Pediatric Urological Service at the Medical Center. Professor Hans H. Zinsser was appointed Consultant in Urology to the St. Albans Naval Hospital.

Research Projects

In the Uropathology Research Laboratories of the Squier Urological Clinic, the following work has been in progress during 1960 under the direction of Professor Meyer M. Melicow and Dr. Aurelio C. Usón.

A study on the activity of the enzymes β -glucu-

ronidase and phosphatase in the urine of patients with bladder cancer, cancer of urologic tract other than bladder, non-neoplastic lesions of the urologic tract, cancer of organs and systems other than the urologic, and non-neoplastic (medical) conditions of systems other than the urologic, has been carried on under a grant from the American Cancer Society by Professor Melicow, Professor T. Duane Price, Dr. Usón and Miss Rita Lipton.

A "normal" range value of the activity of the above-mentioned enzymes was first established by assaying urines from young, healthy adults. Wherever possible three consecutive twenty-four hour urine specimens were collected from each individual. A total of 236 patients and ten controls were studied in this manner and over 1,100 determination of β -glucuronidase alone were carried out. It was found that the activity of β -glucuronidase in the urine was usually increased in patients with bladder cancer, with cancer of other organs and also in benign prostatic hypertrophy and urolithiasis.

Professors Melicow and Price and Dr. Usón and Miss Lipton have applied the isotope method to studies of aspects of tryptophan metabolism related to the endogenous development of neoplasms in the urinary bladder. Studies of the urinary catabolites of tryptophan labelled with C^{14} have been started on a small number of rats. Changes in the normal dog bladder following irradiation with intracavitary and radioactive Silver¹¹¹ are being studied. Following the insertion in normal dog bladder of balloons containing varying doses of Silver¹¹¹ for periods ranging between one and eleven days, there were hyperplastic and degenerative changes noted in the urothelium. These were accompanied by mild to moderate severe inflammatory reaction in the lamina propria of the bladder. All these changes appeared to have regressed in subsequent bladder biopsy specimens.

It is not clear in this experiment whether the changes outlined above were due solely to irradiation.

tion. The examination of the bladder biopsies and of autopsy specimens from both series, obtained so far, has failed to demonstrate any sustained specific change or permanent injury attributable to radiation dosages used in this experiment (64-4500 rads in one to nine days).

Dr. Uson has tested three different methods of ureteroneocystostomy in dogs in relation to removal of the bladder for cancer: full thickness flap of bladder wall; the insertion of plastic valves; and the use of ileal conduits. It was found that the technique of ureteroneocystostomy using a full thickness bladder flap can be safely performed. This was particularly true when the bladder was large and healthy, the ureteral defect not longer than twelve cm., there was no serious concomitant urinary tract infection and the ureter was not too small in caliber. This technique can be applied to humans and be made safer by using splinting ureteral catheters, nephrostomy or cystostomy tubes and tissue drainage through the wound, if necessary. The present report is limited to the first method.

Professor Harry Seneca has pointed out the correlation between the development of resistance to drugs and the presence of certain enzymes in the refractory bacteria. For instance, the ability to split urea is correlated with drug resistance to a high degree. An exhibit demonstrating this correlation won the First Prize as the best urological research in the country, at the 1960 meeting of the American Urological Association in Chicago, Illinois. The logical step from this demonstration of the relationship of resistance to enzymes is the introduction of enzyme blocking chemicals as adjuncts for the treatment of refractory infections. This attack has proved surprisingly successful and has even resulted in a reversal of drug resistance to a state of drug susceptibility, among some refractory organisms, when they were exposed to enzyme inhibitors. Bacteria can be classified according to their enzyme activity, and fall into seven different groups on the basis of their ability to utilize citrate or split urea. If the basis for classification is made dependent upon the available enzymes and substrates of the Krebs cycle, there are eleven groups of bacteria. It has been necessary to devise methods for measuring quantitative differences in urease activity, for instance, in order to evaluate the differences

among these various bacteria. Sonic lysates of these various bacteria are now being studied for their urease activity. For the purposes of this study, a method for measuring the amount of urease (in units) has been devised, in which one of our units is the amount of enzyme which will convert one milligram of urea into ammonia.

A number of enzyme blocking agents have been tested and have surprising effectiveness as anti-bacterial drugs. These are now being tested in combination with antibiotics and other well established anti-bacterial agents in a search for further effectiveness.

Skin Test for Carcinoma

The fact that an antigen made from trypanosomes give a positive skin test in a large proportion of patients with cancer is still being studied. The latest tabulation indicates that eighty-six per cent of our patients with cancers gave a positive skin reaction when tested with this agent. This antigen is now being tested widely on the Urological Service and on patients at the Delafield Hospital who have cancer. New methods for preparing the antigen are being tested, with ultrasonic lysates now being lyophilized and tested for stability. This material will also be used to immunize animals against trypanosomes. There is some indication of a protective activity of this substance against sarcoma 755 in C57 mice. Trypanosomes are also being grown on various chemicals which are known to be carcinocidal. It is hoped that various types of autogenous tumor vaccines can be used for patients with various cancers by altering the tumor DNA and making it antigenic.

Experimental Pyelonephritis

Experimental pyelonephritis has been induced in large groups of rats over the past two years by infecting one kidney with a known virulent enterococcus by obstructing the ureter for thirty minutes at the time the organisms are introduced into the vein. All rats had positive urine cultures one week after the procedure. Some rats were treated with meticorten, some with tetracycline and some with a combination of both. Others were kept as controls. It was demonstrated that tetracycline and tetracycline plus meticorten cleared the infections quickly but that meticorten

alone was of no value. There appeared to be a temporary advantage in the rats treated with meticorten plus tetracycline, but this has not been persistent over long follow-up periods. These studies will be continued.

For one week of each year, all patients entering the Urological Service have been tested to determine what organisms are present in the urine. As different years are compared, it is hoped to determine whether there is an increase in the number of cases infected by any given organism. It is strongly suspected that the enzyme producing bacteria among the coliform organisms, such as *B. proteus* and *A. aerogenes*, as on the increase.

Kidney Stones

Kidney stone research has progressed satisfactorily under the direction of Professor Zinsser. A first prize for the best project submitted by any house officer of a department of urology in New York City was won by Drs. Leon Bernstein-Hahn and Seymour White who devised a method for making non-opaque uric acid stones become opaque to X-ray. This was accomplished by staining them with a radio-opaque form of methylene blue. This will make it possible to tell whether negative shadows in the kidneys are uric acid stones rather than blood clots or tumors. Other projects in this field now going forward are those to determine the source of oxalate in oxalate kidney stones, the use of enzyme inhibitors to stop the infections which cause struvite kidney stones, and the fractionation of the mucopolysaccharides which are found abundantly in patients with kidney stones, for their identification. Kinetic studies of the molecules which are found to be increased in patients with kidney stones are going forward with Dr. Igo Light. Methods of decreasing or increasing fertility are being studied in a new fertility clinic under the direction of Professor Zinsser and Drs. Louis J. Dougherty and Henry Covelli.

Cancer Research

Professor Veenema has instituted the study of certain chemotherapeutic agents in cancer of the bladder. Several patients have been treated using direct bladder instillations of Thio-tepa and also injections of Thio-tepa into the base of the tumor.

Studies done previously elsewhere on transplantable bladder tumors in animals have shown Thio-tepa to be effective in preventing tumor transplantation. Preparations are underway to further evaluate chemotherapeutic agents in artificially induced bladder tumors in animals.

In cooperation with eleven other research centers, studies are in progress to evaluate chemotherapy in advanced prostatic cancer. This study uses patients who have either relapsed following previous treatment or who have proven refractory to antiandrogen therapy from the outset. The use of radioactive phosphorus in cases of prostatic cancer with extensive bone metastasis is also being evaluated.

In cooperation with the tissue culture laboratories of Dr. Samuel Graff, Professor of Biochemistry, efforts have been undertaken to culture both normal kidney tissue and tissue from renal tumors. It is hoped that this will lead to further understanding of histochemical and cytological behavior of renal tumors.

A clinico-pathological analysis of patients with carcinoma of the cervix who present urological complications either post-radiation or post-radical surgery has been initiated. It is hoped that this analysis will lead to improved methods for managing the obstructive ureteral problems that occur in association with fibrosis and/or recurrent cancer. An effort will be made to obtain endoscopic and urographic common denominators which may assist in predicting or differentiating those patients who have obstruction as a result of neoplasm from those who have obstruction of the ureters due to radiation or operative fibrosis.

The use of the ileal conduit is being evaluated as a method of urinary diversion in radical pelvic surgery and as palliation in the study of obstructive uropathy associated with inoperable pelvic tumors.

Tuberculosis

Tuberculosis research has progressed, as previously, with the testing of new anti-tuberculosis drug regimens which are approaching one hundred per cent in effectiveness against this disease. Combinations of drugs, which can all be taken by mouth, are currently being tested. Quicker and more effective methods for recovering tubercle bacilli from urine are being tested experi-

mentally by Dr. Amir Samuel, a Visiting Research Fellow from Egypt. Dr. Boyouk Farvar, a Visiting Research Fellow from Iran, demonstrated that in patients where pyuria ceased, the kidney tuberculosis practically never became re-activated. The persistence of pyuria did not necessarily indicate continued activity or re-activation but was always present if re-activation occurred.

The Department of Urology continued its pioneering work in the field of functional closure of the urinary bladder for exstrophy. The department has had experience with some forty-five cases done by this method. A reconstruction of the bladder and genitalia is necessary and has been satisfactory in a great proportion of these patients.

Dr. Stanley B. Braham has been working on a new method for implanting the ureters into the sigmoid colon when it is necessary to remove the urinary bladder, as for cancer. Dr. Archie L. Dean, Jr. has continued to develop latex models of the body on which examinations can be made by medical students, to teach the difference between various types of pathology in the prostate, such as cancer, benign enlargement, stones, etc.

Dr. Myron S. Roberts culminated his research work on the effectiveness of Dimethylchlortetracycline (Declomycin) in the treatment of genitourinary infections, with a scientific exhibit shown at the Annual Meeting of the American Urological Association at Chicago in May 1960.

Professor Price and co-workers have continued studies on the metabolism of nucleotides and nucleic acids of rat liver. The soluble ribonucleic acid fraction of total ribonucleic acid had been found to be unique in that extensive exchange reactions occur at the ends of the macromolecules bearing a free 3'-hydroxyl group. This fact had been adumbrated by discovery by others of similar or identical reactions in cell-free extracts, but

the finding of occurrence in vivo emphasizes their relevance in connection with mechanisms of synthesis of both nucleic acids and proteins. Investigations of metabolic origins of phosphorus of minor nucleotides of ribonucleic acid of liver and of deoxyribonucleic acid of *E. coli* also have been in progress.

In search of new metabolic antagonists of nucleotides, seven new analogues of these compounds bearing sulfate groups in place of the characteristic phosphate groups have been synthesized.

In collaboration with Professor Melicow's group, there has been initiated a study of the mechanism whereby administered tryptophan may function as a carcinogen or co-carcinogen in the induction of neoplasms of the urinary bladder.

Acknowledgment

The members of the department are grateful to all those who contributed to its research funds. These included the United States Vitamin and Pharmaceutical Corporation, The National Vitamin Foundation, the Garrett Corporation, The National Cranberry Association, The Gulf Foundation, Bristol Laboratories and the Sterling-Winthrop Research Institute, the Beinecke Foundation, Dr. & Mrs. Fish, Dr. & Mrs. Lattimer, Mrs. Roger Milliken, Mrs. Alice Statler, Charles A. Barber, Messrs. Harry Gilbert, Robert Englander, Alex H. Ardrey, Arnold Eckhart, Edwin S. Vogel, Henry Kohn, Herman Goldman, Clarence Dillon, F. Trubee Davison, William K. Holt, Edgar Newberry, Dr. Harry Emerson Fosdick and the Estates of Christine Maurer and John L. Given, Jr., the American Cancer Society, The Atomic Energy Commission, Merck & Company, New York Tuberculosis & Health Association and The Population Council, Inc.



Medical Library

THOMAS P. FLEMING, *Professor of Library Service*

Prospects for the new library seem ever brighter. Together with the architect, preliminary sketches have been drawn and now it seems only a question of time and money.

During the early summer we removed some 40,000 monographic volumes from the South Property Annex on 165th Street and reinstalled them on the same shelves in the Sheffield Farms Building on West 125th Street. The collection was unserviceable for several months. We also sent an additional 5,000 volumes of periodicals to the Butler Library on 114th Street. We have now filled our allotted space there, and must soon start using space in the Low Library on 116th Street as a further annex. The size of our collection is now 238,000 volumes. Our present rate of net addition is around 8,000 volumes (2,500 volumes are withdrawn each year). We receive 3,259 periodicals a year, or net increase of 159. This means that for every volume we put in this library one must go out to an annex or be disposed of in some way.

We are in no position to say what effect the additional research laboratories will have on the library, but it seems fair to predict that additional facilities will result in more personnel being engaged in research on new fields and intensifying activities in established fields. This will place further responsibilities on the library to provide additional literature and services.

As the principal Medical Center source for documented information, we are in a good position to note the rise and fall of research interests in various fields and the activities of departments and individuals. In 1954, we pointed out that our resources for documented data in certain specialities were not up to our usual standards. In the past year, we have been made painfully aware of this fact by our inability to provide literature promptly in at least two areas. Nevertheless, we welcome this indication of vigorous activity for it has enabled us to strengthen our collection along the lines of present day research.

The use of the library continues to mount;

260,500 volumes were consulted last year, an increase of 9.5 percent over 1959. The Bibliographic Service continued its function of supplying references to the literature on subjects currently under investigation. More than 11,800 references, an increase of thirty-one percent, were supplied on forty-seven subjects of which sixteen were new. Orientation tours and lectures on the use of the literature were again given to the entering classes. It is noted, however, that interns and residents are making an increasing number of requests for individual instruction in the use of the literature of their specialty. We plan to extend formal instruction to these groups on an annual basis via the various departmental Journal Clubs.

A preliminary report has been published of our investigation into the present adequacy of international indexing media for the subject analysis of journal supplements. As a result of our study we have discontinued the preparation of analytics of monographic supplements to journals.

We have undertaken the project of cataloging the publications in the Tod Memorial Library in Maxwell Hall. Phyllis Dain, Assistant Supervisor, Cataloging Department, resigned to accept an appointment in the School of Library Service. Her successor has not been appointed as yet. Because of the pressure of duties an additional Librarian, Brenda Crudge, was appointed as Cataloger.

The services and resources of our library continued to be studied by librarians throughout the world. Visitors from the British Isles, Japan, Switzerland, Thailand, India, U.S.S.R. and the Philippines spent varying periods of time with us.

We again provided "in service training" of four to six months for Medical Librarians from Costa Rica, Indonesia, the Philippines and Vietnam. The library also served as the laboratory for thirty-four students taking the special courses in Medical Librarianship given by the Librarian under the auspices of the School of Library Service.

The excellence of our resources is in large measure dependent upon continued gifts from all our clientele, alumni and friends. While it is not possible to enumerate all those who have contributed publications and monies, some of the outstanding gifts received deserve special mention. The P&S Alumni Association contributed funds at a particularly crucial time. Dr. Jerome P. Webster continued his past generosity by contributions for the purchase of publications in the field of plastic surgery. Forty former colleagues and friends established a gift fund in memory of

Dr. Frank P. Shepard, Jr. and Dr. and Mrs. Walter S. Root contributed funds for the purchase of publications in honor of Professor Cushman D. Haagensen. Through the good offices of Dean Emeritus Willard C. Rappleye we received from the Josiah Macy Jr. Foundation an extraordinary gift of journals spanning the last fifteen years. In all more than 1,000 bound volumes and some 1,700 issues of seventy-three different journals were received. These additional copies make possible a more generous lending policy.

Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. JOHN S. TILNEY, *President*

The year 1960 will always be remembered by the Board of Women Managers of Babies Hospital as the ending of an era — for in July, Dr. Rustin McIntosh, the beloved Director of the Hospital for the past thirty years, retired. His outstanding service as doctor, teacher and Director of Babies Hospital is well-known throughout the medical world. His belief and expectation that each individual was working to capacity, giving only his best effort, resulted in a unique quality of dedication to him and to Babies Hospital by all those connected with it. It was indeed a difficult task to say good-bye.

The Board presented a Steinway upright piano to the House Staff in Dr. McIntosh's name — a gift which, it was felt, combined two of his main interests — music and the Hospital. It was indeed only a small gift in comparison to the gratitude and friendship that all felt for the very close association which had been enjoyed for so long.

In September, Dr. Edward C. Curnen, Jr. was welcomed to Babies Hospital as the new Director of the Pediatric Service. Dr. Curnen had been Professor and Chairman of the Department of Pediatrics at the University of North Carolina. Dr. Curnen spoke at the November Board meeting and told of his work and interests in the past and his hopes and plans for Babies Hospital in the future. The members were delighted to meet the new director and to have had an opportunity to hear his ideas. The Board looks forward to working with him in the coming years.

The budget for 1960 was \$18,650. This represented support for the Care of Ward and Clinic Patients, Emergency Nursing Fund, Recreational Therapy, Pediatric Psychiatric Clinic, Volunteer Department, House Staff Loan Fund, and Christmas Dolls and Toys. In addition to this budget, \$2,500 was given to the Emergency Nursing Fund.

The Board is grateful for the many gifts and contributions received during the year from: American Express Company; Mrs. Neville J. Booker; Mr. James Campbell; Chase Manhattan Bank, American Legion Post; F. A. O. Schwarz;

Fort George Presbyterian Church; Mrs. Charles V. Hickox; Holy Rood Church; Kohner Bros. Inc.; Lions Club of Upper Manhattan; New York Telephone Company (Doll and Toy Committee); Mr. Edgar A. Newberry; Radio Station WMCA; School of Dental and Oral Surgery; Scrappie Secretaries of America; Women's Sportswear Buyers Club and WOR Children's Christmas Fund.

The members were most interested in the guest speakers at the Hospital meetings and would like to express their appreciation to Dr. Ruth Harris, Dr. McIntosh, and Dr. Curnen.

Mrs. J. Taylor Howell and Mrs. Lewis Harder were welcomed as new members of the Board. Mrs. William Thompson, the former Mrs. Charles H. Thierot, Jr., has moved to Victoria, British Columbia, and has resigned from active membership to become an Associate Member.

The resignation of Mrs. James A. Edwards, Associate Member, was accepted with regret. The Board was grieved at the death of Miss Katherine B. Lockwood who served for fifty-six years on the Cribside Social Service Committee.

Mrs. R. Peter Rose, Chairman of the Recreational Therapy Department, has completed another year of dedicated service to the Hospital. Her support and interest in this field is most appreciated by Miss Ruth Vickers and the Board. In February, Mrs. Fred Meyers, school teacher for Recreational Therapy, retired and was replaced by Miss Rosalie Castagnetta. The recreational program so ably carried out by Miss Vickers and her assistant, Mrs. Gerald Murphy, has been outstanding.

Mrs. Fred L. Heyes served again as Chairman of the House Committee. The usual maintenance programs were carried out. No large scale improvements were undertaken because of the planned modernization of the Hospital. New furniture throughout the patient areas was obtained and is a great improvement.

Mrs. Thomas V. Santulli and Mrs. Munn Baker, Co-Chairmen of the Volunteer Committee, met each month with other auxiliary representatives to discuss the Volunteer program with

Miss Laura M. Vossler, Director of Volunteers. The Volunteer Tea was attended by members of the Board and Mrs. John S. Tilney presided.

The Recreational Therapy, X-Ray Department and the Tender Loving Care Program had a full complement of volunteers in Babies Hospital. Volunteers also assisted on the fourth and fifth floors, in the Open Heart Surgery Unit and in many other areas throughout the Hospital.

The "Candystripers" were again headed by Mrs. Baker. These teenagers under Miss Marjorie Peto's training program have done a splendid job throughout the year, especially during the summer months.

The work of the Volunteers in the Hospital is invaluable, and the Board would like to express its appreciation for their wonderful assistance in Babies Hospital, and also to Miss Vossler for her splendid cooperation.

The Nursing Committee was headed by Mrs. Douglas Williams. Miss Peto reported that as of mid-September the nursing staff had its full complement of supervisors, head nurses, assistants and staff nurses, with seven additional nurses assigned to special nursing.

The Educational Program continues to be a vital part of Babies Hospital. Three new schools, Westchester School of Nursing, Burbank Hospital at Fitchburg, Mass., and Columbia Memorial at Hudson, N. Y., bring the number of affiliating schools to sixteen.

The Emergency Nursing Fund has helped seventy patients at the cost of \$14,929.60. Generous donations to the Fund were made by the following: Mrs. Baker, Mrs. Bradley I. Collins, Mrs. Casimir deRham, Mrs. Frederic F. deRham, Miss Ethel F. Donaghue, Mrs. Enrico Ducrot, Mrs. Alexander L. Keyes, Mrs. Joseph V. McMullan, Mrs. John H. Reynolds, Mrs. Santulli, Mrs. Henry C. Taylor, Mrs. William Thompson, Mrs. Tilney, Mrs. Carll Tucker, Sr. and Mrs. Douglas Williams. The demands on the Fund continue to increase due to the Special Nursing Units and the number of unusual cases being referred to Babies Hospital by other hospitals and physicians. No patient is denied special nursing because of the parents' inability to meet the cost.

Miss Peto has had two successful eye operations this year. Everyone is delighted that she is back on duty again and fully recovered.

Each month two members of the Board visited the Hospital and reported their findings at the following meeting. In addition, new members of the Board toured the Medical Center in May.

The Auxiliary Luncheons were attended every month by members of the Board. These meetings with Mr. A. J. Binkert, Executive Vice President, and the auxiliary members are important and of great value in keeping committee members informed on other Hospital activities.

Mrs. Richard Migel has done outstanding work this year as Group Leader for Babies Hospital in the United Hospital Fund Drive. Her able Team Captains were Mrs. Collins, Mrs. Grover O'Neill, Jr., Miss Dorothy Mills and Miss Hope Kingsley. They are to be congratulated for their fine assistance. To date Babies reports a total of 438 gifts for \$35,172.

Mrs. Santulli is to be congratulated for her excellent work as Chairman of Box Week for Babies Hospital. She has made a great effort to stimulate interested participation in this drive, and has succeeded in almost doubling the total as well as the enthusiasm. The receipts to date are \$424. There are still boxes to be counted.

Mrs. Tilney served as Chairman of the Women's Division of Manhattan and Bronx of the United Hospital Fund campaign.

As the year ends, the Committee is about to embark on the raising of money for the Development Program for the Medical Center. The Board is delighted that Mrs. B. Rionda Braga, its Treasurer, will serve as the Chairman of the Women's Auxiliaries for this Drive. We are proud to announce that the Honorary Chairman of the Babies Hospital Auxiliary will be Mrs. Booker, and the Co-Chairmen will be Mrs. Taylor and Mrs. Carll Tucker, Jr. I know that each one of us is anxious to do her utmost to make our participation as successful as possible. We feel it is a privilege and an honor to support this Drive.

To all the members of the Board, I would like to express my very sincere thanks for their support and loyalty. In every way they have been most helpful and I cannot say how appreciative I am of them. And to Miss Elizabeth Callahan, we are ever mindful of her understanding, knowledge, efficiency and kindness. The Board would also like to express thanks to all the department heads for their interest and help.

Cribside Social Service Committee

MRS. LEO C. FENNELLY, *Chairman*

For the past five years Mrs. Conrad M. Riley has been the inspiring Chairman who guided the Committee so ably through all its problems and who worked so closely with the Social Service Department. It is with the greatest regret that we report her resignation as Chairman, necessitated by a change of location. The Committee wishes to thank Mrs. Riley for her great help, and to tell her what a real loss her leaving has been.

A grant of \$400 was again made to the Committee by the United Hospital Fund for payment of salary of a third year college student assigned to the Social Service Department of Babies Hospital for eight weeks during the summer. This was done in conjunction with the Social Work Recruitment Committee.

The recipient of the \$2,300 scholarship, offered by the Committee to the New York School of Social Work in 1959-1960, began work in the Department in July. A scholarship grant of \$810.00 was made in the fall semester to a student of the New York School of Social Work, who was similarly assigned to Babies Hospital Social Service for her field work experience. In addition, one student from the Fordham School of Social Work is in the Department.

The social work staff had a full complement of workers for the greater part of the year. Considerable time was spent by workers in contributing to the teaching of medical and nursing students. Additional Social Service coverage was requested, though not entirely met, on the Pediatric Cardiac and Cleft Palate services.

The Social Service staff has been engaged in helping many families face the implications of their children's illnesses. Problems of chronic disease continued to require a great deal of thoughtful consideration on the part of the workers. School problems, management at home, convalescent care, camping for the handicapped and planning for minimally adequate care for the premature baby, were a few of the more demanding

problems. Crowded housing, drug addiction of young mothers and neglect and abuse of children seem to have increased in frequency.

A total of \$2,215.91 has been spent by the Committee for medical relief and assistance to patients during 1960; of this \$875.16 was spent for camp care. Salary expense of \$20,761.74 has been assumed by the Cribside Committee.

The Bargain Box had a busy year under the able guidance of Mrs. Herman L. Hoops. Receipts from sales contributed \$8,474.38 to the funds of the Social Service Department.

The Sewing Class held two meetings during Lent and brought in \$405.32 in addition to the articles of clothing that were made for the Hospital.

The endowed beds of the Cribside Committee were used on nine occasions during 1960, and their use was greatly appreciated by the young families who were able to take advantage of them. It was also decided to give \$500 to the Emergency Nursing Fund.

The Committee wishes to express its gratitude for a gift of \$250 made by the Theodore Schultz Foundation for medical-social needs. It is also very grateful for the many other donations which have been received. Some of these donors remember us year after year.

The Committee was greatly saddened by the death of Miss Katherine Lockwood who was a member of the Committee for fifty-six years, and always tremendously interested in its work. We shall miss her keen interest.

To the Cribside Committee, 1960 will be remembered as a year of many changes, but the most important was the retirement of Dr. Rustin McIntosh. We shall miss his wise counsel and help, but we are very grateful for all that he did for us over so many years. We are looking forward to many years of congenial association with Dr. Edward C. Curnen, Jr.

The Mary Harkness Convalescent Home Auxiliary

MRS. EDWARD M. WHEELER, *Chairman*

The Mary Harkness Convalescent Home Auxiliary held its five stated meetings during 1960, the May meeting in the form of a luncheon at the home of Mrs. Robert C. Wheeler, outgoing Chairman. The members of this Auxiliary feel it is a privilege to work with the Mary Harkness Convalescent Home, which continues to serve a vital purpose as the final step in the Progressive Care Program of The Presbyterian Hospital.

We feel the Home has functioned very smoothly this year under the direction of Miss Miriam Hubbard, R.N. Doctors John T. Beaty and Robert C. Darling continue to provide excellent medical attention to the patients, who also benefit constantly from the talented services of Mrs. Susan Millman, Occupational Therapist and of Mark Glatzer, Physical Therapist, a faithful fellow-worker. Of necessity, there have been some professional staff resignations. Replacements for these positions have been from the local area.

The Auxiliary has followed with interest renovations to the Home, which include outside painting, new furniture, and insulation of the living room floor. These add to the beauty of the Home, and also enhance the service to the patients.

We are grateful to the Women's Auxiliary of the New York Orthopaedic Hospital for continuing to provide weekly movies for the patients; to the many Brownie and Girl Scout troops from local communities who have provided entertainment and holiday favors for the patients; to the St. Cecelia Singers of Riverside, Conn., for a concert; to the New York Telephone Company for several entertaining evenings of movies or talks; and to Ethel Campbell for a musicale.

To add to the homelike atmosphere of this convalescence center, the Auxiliary gave a Christmas Party to the patients, with musical entertainment by the Westminster Choir of the Rye Presbyterian Church. Gifts were provided on Christmas morning for all patients, and remembrances for the nursing staff and employees. Thanks are due to the ladies of the First Congregational Church of

Chappaqua for contributing some of these gifts.

This Auxiliary has set up a system and program for primary responsibility among its members. Each month, one Auxiliary member is available to Miss Hubbard for whatever services or consultations are desired. This member attends the monthly luncheon at The Presbyterian Hospital, and also visits the Home once or twice during the month to familiarize herself with the workings of the Home and to form closer relationships with the personnel. This has proved a happy arrangement for all concerned.

To keep the members informed on the activities and needs of the Home, Miss Hubbard reports at each of our five meetings on events during the preceding two months. Also, her warm and friendly Quarterly Newsletter, sent to many friends of the Home, is valuable in keeping alive the contacts of the Home, and in disseminating non-medical information about the Home.

During 1960, we have been sorry to accept the resignations of Mrs. William L. Crow and Mrs. Henry F. G. Wey, Jr. The Country Store has made its last payment on the loan by the Auxiliary, and is now entirely self-supporting. It is felt that a real service to the patients is performed by having available for them, at regular prices or less, many small articles which add to their peace of mind. Several gifts have been made to the Home, including books by Dr. Beaty, a floor fan by Mrs. J. Brooks Hoffman, and a radio by Mrs. Howland O. Walter. During 1960 we rearranged our fiscal year to coincide with that of the Hospital.

We have made gifts of \$25 to Miss Hubbard to fill some of the small decorative needs of the Home, and \$60 to Mrs. Millman toward her expenses incurred while attending a month's course at the Institute of Rehabilitation.

We are glad that the grounds of the Home have been enjoyed for picnics and outings by several departments of The Presbyterian Hospital, as well as by some local community groups.

Neurological Institute Auxiliary

MRS. SIDNEY J. WEINBERG, *Chairman*

We are happy to report another year of service. From our list of thirty-three active members we usually have an attendance of twenty ladies at our monthly meetings. This interest, we believe, is due to the excellent reports we hear from Miss Esther Shaw, our director of Neurological Social Service, and the informative talks of a guest speaker. Each month, we invite a Hospital staff member of another department whose problems and successes give us new ideas and an incentive to continue our own projects. During this year a few of our guests have been Miss Eleanor Lee, telling us of Nurses' scholarships — Miss Laura Vossler with Volunteer problems — Miss Helen Coxhead, Public Interest — our own Unit Manager of Neurological Institute, Miss Catherine Gallagher — and Miss Elizabeth Prichard who is always most helpful.

The Social Service staff at Neurological Institute has only one vacancy and seems stronger in competency than in the past few years. It is now able to serve semi-private and private patients as well as those in the wards. Each patient, during his Hospital stay, is now being seen by a social worker. This has proven to be very helpful to the patient.

We have supplied funds for a course at the New York School for Social Work, and also for Dr. Robert C. Darling's course in rehabilitation at Columbia University Teachers College. These courses were taken by two of our Social Service workers.

Now that the reconstruction of Neurological Institute is almost complete, we feel pride and satisfaction in the results. The 12th floor for psychiatric use has filled a great need. Our House Chairman, Mrs. J. Lawrence Pool, did an excellent job in the selection of furniture, colors and fabrics for this floor and other parts of the Institute where changes were made.

A contact with the United Hospital Fund Art Department gave our Auxiliary the opportunity of selecting many paintings, lithographs and

posters for the walls of waiting rooms, children's room, doctors' offices and hallways. Many patients, as well as the staff have enjoyed these touches of beauty and add their thanks and appreciation to United Hospital Fund for this generous gift. Under the chairmanship of Mrs. Donald David, we are starting an "Art Cart Project" — Volunteers wheeling a cart with small reproduction pictures to the bedside, offering patients their choice of a different picture each week for wall or table.

The Summer Camp Department under Miss Marion Holland had a successful season. Some adults, as well as children received benefits this year.

The fund for special nursing is used with great discretion by Miss Gallagher. The Auxiliary considers this fund one of its most useful contributions.

We report with sorrow the deaths of two of our members — Mrs. Richard L. Morris and Mrs. Reginald E. Wigham.

We are pleased to welcome three new members — Mrs. Edward J. Bermingham, Mrs. Irving Kingsford, II and Mrs. John Hoyt Stookey.

Once again Mrs. Royall Canaday and her hard working committee have done an outstanding job in Thrift Sales.

Mrs. Henry Riley and her committee ran a successful Fashion Luncheon at the Hotel Pierre.

I regret that space prevents my naming all of the other members who contributed so much in time and effort. But special appreciation must be expressed to Mrs. Edith Achilles and Mrs. Charles E. Adams for their untiring and successful work on the United Hospital Fund. Also to Mrs. Bruce Brodie, the Vice Chairman who conducts meetings, when called upon, with the tact, precision and ability for which she is known.

And last of all, I want to pay tribute to my predecessor, Mrs. H. S. Fenimore Cooper, whose records and constant friendly advice, made it possible for me to try to carry on.

Women's Auxiliary of the New York Orthopedic Hospital

MRS. ROBERT E. CARROLL, *Chairman*

1960 has been another busy and rewarding year for the Auxiliary. Expenditures of \$28,451.08 have supported ward and clinic patients, the House Staff Loan Fund, Scholarship Aid to Graduate Nurses, the Milbank Library, the Volunteer Department, the Nurses' Card Party and the Mother Goose Ball. Included also are the salaries of two recreational therapists, Christmas presents for all hospitalized children and all non-professional help on the fifth floor, as well as gifts to many of the clinic families. Our therapists, one for adults and one for children, provide stimulus and warmth to the hospitalization of ward and semi-private patients.

Mrs. Doris Lagergren, Recreational Therapist for the adults is to be commended for her devotion to the Orthopedic Hospital. Not only does she work her prescribed number of salaried hours, but after hours she dons a pink smock to continue her work as a volunteer. Her husband is equally devoted and works long hours as a volunteer, preparing materials for the many imaginative articles made by the patients.

Because television provides sufficient and good entertainment, the bi-weekly movies shown in the adult wards for many years have been discontinued. Occasionally, Mrs. Lagergren obtains movies from the Public Library which are entertaining and interesting, and — of great importance to the Auxiliary — free. This has made a great difference in our budget.

Mrs. Eva Hoffman, in her fifth year as Recreational Therapist for children, has again done a remarkable job in organizing her work and providing a happy hospital stay for the children. When forced to take a leave of absence early in the year, she inspired a former volunteer, Mrs. Jean Tsai, to fill in for her. Mrs. Tsai has stayed on and is now working full time in the Occupational Therapy Department. During her summer vacation, Mrs. Hoffman's work was ably carried out by one of our young volunteers. The work in arts and crafts is outstanding and Mrs. Hoffman's

contagious enthusiasm is reflected in the spirit on the fifth floor of Babies Hospital, and in the quality of the work produced. She organized many gay parties for the children with professional entertainment.

An abundantly successful volunteer program was instituted this year. With the help of Mrs. Thomas Hitchcock and the careful and thoughtful efforts of Miss Laura M. Vossler, Director of Volunteers, thirty wives of second year medical students gave many hours of evening service to the children's ward and can boast a perfect attendance record. Mrs. Hoffman gave extra time for the orientation and guidance of this wonderful group. It was a rewarding venture for everyone concerned. In June Mrs. John C. Condliffe, who serves on the Volunteer Committee, entertained a number of these medical students and their wives at her home.

Due to the efforts of Mrs. Hitchcock and the Housekeeping Committee a large fan and venetian blinds were added in the playroom and have greatly increased the comfort of the patients in the summer. Installation of air conditioning is not possible. We appreciate the help and cooperation of Mr. Dale K. Tuller, Assistant Vice President for Nonprofessional Services.

In the spring, under the able and delightful chairmanship of Mrs. Sheldon Whitehouse, the Auxiliary held its first benefit. A portrait show, entitled "Portraits of Children, 1860-1960," it was held at the gallery of Portraits, Inc. There was an opening day party to which sponsors and subscribers were invited followed by three weeks of general admission for the public. Mrs. Helen Appleton Read, president of the gallery is responsible for the high professional standards of the show. Our deepest thanks go to Mrs. Marguerite Stein in the Public Interest Department. Without the interest and remarkable ability of Mrs. Stein and her staff the benefit could not have been the success it was. Mrs. John Pierrepont, Mrs. Oliver D. Filley, and Mrs. Robert E. Carroll were Co-

chairmen. The net receipts from the benefit were \$4,200.

In addition to the generous contributions of Auxiliary members, the Auxiliary was the recipient of a legacy of \$42,000 from the estate of Mary E. Secor. The income is to be used for the recreation of the child patients. We are tremendously grateful for this wonderful gift. Under the very able leadership of Mrs. Edward H. Gerry, Group Leader, and Mrs. William G. Maguire, Team Captain for the 1959 United Hospital Fund Campaign, the Auxiliary in 1960 received \$17,011 in Direct Benefits, having raised a total of \$43,921. Under their continued leadership in 1960, the Auxiliary has raised \$40,612.97. Mrs. Gerry and Mrs. Maguire are to be congratulated on their truly outstanding job.

In September, Mrs. Carroll, along with other members of the various auxiliaries helped entertain some of the wives of the members of the International Hospital Study Tour.

The Women's Division of the United Hospital Fund Campaign for 1960 has been ably headed by Mrs. John S. Tilney, Chairman of the Board of Women Managers of Babies Hospital. She has been assisted by three members of the Ortho-

pædic Auxiliary, Mrs. John R. Drexel, III, as Vice-Chairman, Mrs. Carroll, Chairman of Hospital Teams, and Mrs. Maguire as Vice Chairman of Hospital Teams. Mrs. E. Allen Dennison serves on the Occupational Therapy Committee of the Fund and in April moderated a panel discussion.

No effort could be made and no effort could be meaningful if it were not for the guidance, interest, and help of Mrs. Delphine Wolcott, Assistant Director of Nursing in charge of Orthopedics; her assistant, Miss Hester Brown, and Misses Helen and Margaret Irwin who direct the Orthopedic Social Service. Their reports and specific requests made to the Auxiliary at monthly meetings are vital to our function. We are indeed grateful for all their time and help. Our thanks also go to Mr. A. J. Binkert and his staff for the Monday luncheon meetings. These are always interesting and informative.

The Auxiliary is grateful for the understanding and help afforded by the Hospital staff. As President, I am grateful for the many hours of devoted service of our active members. 1960 has been a productive year and we look forward to continuing our associations and activities.

Women's Auxiliary of the Presbyterian Hospital

MRS. HAMILTON SOUTHWORTH, *Chairman*.

In 1960, the Auxiliary budgeted \$20,400 toward the support of the Volunteer Service, the Milbank Library, and the Occupational Therapy Department. The balance at the end of the year was \$4,000. This was divided among the Resident Loan Fund, the Kneeland Fund of Social Service for staff education, and the Milbank Library for expansion.

The United Hospital Fund, the Greater New York Fund and the Stuyvesant Square Thrift Shop are our major sources of income.

The United Hospital Fund Committee, under the able leadership of Mrs. Algernon B. Reese, collected 712 gifts totaling \$33,206, \$1,327 above our quota. Fifty-eight Auxiliary members, eleven more than last year, took part. Mrs. C. Redington Barrett and Mrs. Ralph H. Boots continued their outstanding work.

The Stuyvesant Square Thrift Shop had a very successful year. A profit of \$7,805 was made, although renovations of the shop closed it for most of August. This sum was \$1,126 higher than last year. The success was due to Mrs. Worden DeWitt and Mrs. Lawrence H. Cotter, co-chairmen, to Mrs. Howard R. Craig and Mrs. Paul B. Sheldon, co-chairmen of the Thrift Shop Benefit, and to the active committees of both groups.

We are very grateful to Miss Helen Hayes for the charming and moving talk she gave at the Benefit. The luncheon beforehand was Dutch-Treat, but the tickets to hear Miss Hayes were paid for by articles sent to the Thrift Shop during the months preceding the Benefit. Ninety-six new donors were added to the Thrift Shop list.

The Volunteer Service, under Miss Laura M. Vossler, continues to be of tremendous service to the Hospital. An average of 440 volunteers a month gave more than 9,800 hours. In all, 977 volunteers donated a record 117,946 hours during the year. We are most appreciative of their aid. The annual tea at Maxwell Hall is only a small expression of the Hospital's and auxiliaries'

gratitude. We are glad Mrs. George A. Perera continues as chairman.

As in the past, two Red Cross courses for nurses' aides have been given with the cooperation of the School of Nursing. The Spanish course has again been of value to Hospital personnel. The teenage program has expanded, and orientation and supervision insure its success.

The Milbank Library under Mrs. Selma Gale, continues to expand its service to the patients and to the staff. A total of 36,889 books were in circulation, 2,533 more than last year. Contributions of books and magazines have filled gaps in the Library or have been sold at the successful book sale in November. The profit is to be used for the purchase of new books. This year, with the aid of the nursing staff, the loss of books was greatly reduced.

Mrs. Howard G. Bruenn, the Library chairman, reports that more space and additional help are the Library's most pressing problems. She hopes to remedy this in the coming year.

Social Service rendered 21,589 services to patients during 1960. A total of \$23,664 was expended in their care. Through Mrs. Samuel W. Lambert, Jr. and Mrs. Boots, almoners for the Haven's Relief Society Fund, \$1,300 was used in rehabilitation of individuals and families.

Nine social work students completed their field training in June, and nine more were assigned from the New York School of Social Work in October. Social Service has also continued its responsibilities in the medical and nursing student program.

The Kneeland Fund made it possible for five staff members to take seven courses at the New York School of Social Work.

Miss Elizabeth R. Prichard, the Director of Social Service, reports a stable staff situation and new private offices have helped meet the increasing demands. The staff is concerned over the serious problems in our community as these are reflected in patient needs.

We are grateful to Mrs. George H. Humphreys, II, chairman of Social Service, and to Mrs. Carl T. Nelson for her supervision of the apartment for out-of-town families of patients with the diagnosis of retinoblastoma.

The Auxiliary welcomed four new members this year: Mrs. George A. Carden, Mrs. Cadvan O. Griffiths, Mrs. Hilary Holmes and Mrs. Malcolm McAllister. We are sorry to report the resignation of Mrs. Bruce Brodie and Mrs. Franklin M. Hanger, and the death of Miss Tina M. Skier. Three of our associate members, Mrs. Edward B.

Self, Mrs. Theodore B. Russell and Mrs. Junius H. Browne have transferred to active membership.

The Auxiliary's projects have been made possible by the ability and dedication of so many of the sixty-nine active members. We thank them for their many hours, working in the Hospital and in the Thrift Shop, organizing the Benefit, writing letters and collecting for the United Hospital Fund during box week. We are very grateful to the Administration and the Staff for all their help to us.



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1960 Publications of Members of the Professional and Academic Staffs

Anatomy

- Agate, Frederic J., and Silverman, William A.
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Appendix

EXHIBIT A

THE PRESBYTERIAN HOSPITAL

Balance Sheet

DECEMBER 31

ASSETS

	<i>December 31</i>	
	<i>1960</i>	<i>1959</i>
CURRENT FUNDS ASSETS:		
Cash	\$ 659,767	\$ 518,368
Investments — Bonds, etc. — at cost (market value — 1960, \$1,163,042)	1,144,146	1,111,566
Accounts receivable (less reserve — 1960, \$201,604; 1959, \$211,642)	3,401,704	2,760,758
Supplies and materials	458,810	446,706
Interest accrued and dividends receivable	573,426	548,541
Prepaid insurance, etc.	38,791	46,636
TOTAL CURRENT FUNDS ASSETS	6,276,644	5,432,575
ENDOWMENT FUNDS ASSETS:		
Cash	19,544	560,688
Investments:		
Bonds and stocks — at cost or contributed value (market value — 1960, \$85,048,400)	64,541,586	61,426,714
Mortgages receivable, etc.	56,326	93,319
TOTAL ENDOWMENT FUNDS ASSETS	64,617,456	62,080,721
PLANT ASSETS:		
Property and equipment — at cost (less accumulated depreciation — 1960, \$12,270,861; 1959, \$12,984,707)	25,046,657	22,985,373
Replacement funds — Bonds and stocks — at cost (market value — 1960, \$4,217,319)	3,880,279	4,376,362
Building funds — Bonds and stocks — at cost (market value — 1960, \$909,854)	905,904	
TOTAL PLANT ASSETS	29,832,840	27,361,735
TOTAL	\$100,726,940	\$94,875,031

EXHIBIT A

THE CITY OF NEW YORK

Sheet

AND 1959

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<i>1960</i>	<i>1959</i>
CURRENT FUNDS AND LIABILITIES:		
Accounts payable	\$ 672,474	\$ 559,381
Patients' credit balances	71,857	55,757
Accrued payroll and other expenses	411,795	447,653
Undistributed investment income fund (Exhibit C)	309,341	141,018
Special expendable funds (Exhibit C)	1,750,432	1,732,947
General fund (Exhibit C)	3,060,745	2,495,819
TOTAL CURRENT FUNDS AND LIABILITIES	<u>6,276,644</u>	<u>5,432,575</u>
ENDOWMENT FUNDS (Exhibits C and D)	<u>64,617,456</u>	<u>62,080,721</u>
PLANT FUNDS (Exhibit C):		
Capital invested in property and equipment	25,046,657	22,985,373
Replacement funds	3,880,279	4,376,362
Building funds	<u>905,904</u>	
TOTAL PLANT FUNDS	<u>29,832,840</u>	<u>27,361,735</u>
TOTAL	<u>\$100,726,940</u>	<u>\$94,875,031</u>

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INCOME

For the Years Ended December 31, 1960 and 1959

	<i>Year Ended December 31</i>	
	<i>1960</i>	<i>1959</i>
OPERATING INCOME:		
Care of patients	\$18,777,283	\$17,082,688
Other services	1,943,999	1,761,303
TOTAL	20,721,282	18,843,991
Transfer from special expendable funds (Exhibit C):		
For research	509,850	468,305
For other designated purposes	603,951	583,663
TOTAL OPERATING INCOME	21,835,083	19,895,959
OPERATING EXPENSES:		
Administration	256,114	247,650
Assistant Secretary-Treasurer	186,633	167,714
Comptroller	497,271	416,035
Public interest	151,459	160,007
Convalescent Home	209,187	186,076
Non-professional services:		
Buildings and grounds	3,211,050	2,941,864
Food service	2,792,131	2,636,053
Personnel and protective	311,143	319,288
Other non-professional services	788,642	731,715
Professional services:		
Nursing	6,834,054	6,080,485
Professional staff, doctors' offices and research	2,836,232	2,713,310
Special services	3,758,569	3,371,560
Vanderbilt Clinic and other	1,842,104	1,660,454
Provision for depreciation	1,473,200	1,392,600
TOTAL OPERATING EXPENSES	25,147,789	23,024,811
OPERATING LOSS	3,312,706	3,128,852
OTHER INCOME FOR GENERAL PURPOSES:		
Investment income	2,680,000	2,520,000
Contributions	569,304	649,424
TOTAL OTHER INCOME FOR GENERAL PURPOSES	3,249,304	3,169,424
NET INCOME (LOSS) (transferred to general fund — Exhibit C)	\$ (63,402)	\$ 40,572

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1960 and 1959

	<i>Year Ended December 31</i>	
	<i>1960</i>	<i>1959</i>
GENERAL FUND		
Balance, January 1.....	\$ 2,495,819	\$ 3,027,940
Add:		
Unrestricted legacies	1,324,744	259,672
Gain from investments sold or redeemed.....	1,469	346
Associated Hospital Service of New York retroactive reimbursement rate adjustment for the period April 1 to December 31, 1959.....	376,966	
Net income (loss) (Exhibit B).....	(63,402)	40,572
	<u>1,639,777</u>	<u>300,590</u>
Total	4,135,596	3,328,530
Deduct — Expenditures for property and equipment.....	1,074,851	832,711
Balance, December 31.....	<u>\$ 3,060,745</u>	<u>\$ 2,495,819</u>
SPECIAL EXPENDABLE FUNDS		
Balance, January 1.....	\$ 1,732,947	\$ 1,457,789
Add:		
Legacies and contributions.....	1,041,009	1,017,026
Investment income	433,392	417,033
Other income	257,860	230,568
	<u>1,732,261</u>	<u>1,664,627</u>
Total	3,465,208	3,122,416
Deduct:		
Transfers to:		
Operating income (Exhibit B).....	1,113,801	1,051,968
Endowment funds	33,765	102,500
Building funds	298,919	
Expenditures for property and equipment.....	115,575	75,927
Miscellaneous	152,716	159,074
	<u>1,714,776</u>	<u>1,389,469</u>
Balance, December 31.....	<u>\$ 1,750,432</u>	<u>\$ 1,732,947</u>
UNDISTRIBUTED INVESTMENT INCOME FUND		
Balance, January 1.....	\$ 141,018	
Add:		
Income Earned:		
Investment portfolio	3,400,885	\$ 3,274,717
Income from trusts and undistributed estates.....	64,145	59,686
Total	<u>3,606,048</u>	<u>3,334,403</u>
Deduct:		
Transfers to:		
General purposes	2,680,000	2,520,000
Special expendable funds.....	433,392	417,033
Replacement funds	159,809	256,352
Building funds	23,506	
	<u>3,296,707</u>	<u>3,193,385</u>
Balance, December 31.....	<u>\$ 309,341</u>	<u>\$ 141,018</u>

EXHIBIT C (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1960 and 1959

	Year Ended December 31 1960	1959
ENDOWMENT FUNDS		
Balance, January 1.....	\$54,468,655	\$54,174,257
Add:		
Legacies and contributions.....	1,335,683	191,898
Transfers from special expendable funds.....	33,765	102,500
	1,369,448	294,398
Balance, December 31.....	55,838,103	54,468,655
Portion of accumulated gain from pooled investments sold.....	8,779,353	7,612,066
Total	<u>\$64,617,456</u>	<u>\$62,080,721</u>

PLANT FUNDS

CAPITAL INVESTED IN PROPERTY AND EQUIPMENT:

Balance, January 1.....	\$22,985,373	\$20,850,242
Add:		
Transfers from:		
General fund	1,074,851	832,711
Special expendable funds.....	115,575	75,927
Building funds	157,012	
Net change in accumulated depreciation (excess of replacements and rearrangements over provision).....	713,846	1,226,493
	2,061,284	2,135,131
Balance, December 31.....	<u>\$25,046,657</u>	<u>\$22,985,373</u>

REPLACEMENT FUNDS:

Balance, January 1.....	\$ 4,209,425	\$ 5,179,566
Add:		
Appropriation for depreciation.....	1,473,200	1,392,600
Investment income	159,809	256,352
	1,633,009	1,648,952
Total	5,842,434	6,828,518
Deduct — Replacements and rearrangements.....	2,187,046	2,619,093
Balance, December 31.....	3,655,388	4,209,425
Portion of accumulated gain from pooled investments sold.....	224,891	166,937
Total	<u>\$ 3,880,279</u>	<u>\$ 4,376,362</u>

BUILDING FUNDS:

Contributions	\$ 740,491
Investment income	23,506
Transfer from special expendable funds.....	298,919
	1,062,916
Deduct — Expenditures for property and equipment.....	157,012
Balance, December 31.....	<u>\$ 905,904</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

ENDOWMENT FUNDS

December 31, 1960

THE PRESBYTERIAN HOSPITAL:			Harkness, Mary Stillman, Memorial	
Anonymous	\$	671,289	Research	50,000
Anonymous — For Support of Residency			Harkness, The Mary S., for Conva-	
Training		270,500	cent Care	1,003,045
Arnstein, Daniel G.....		80,000	Harkness, William Hale, Memorial...	43,416
Baker, Frances E.....		11,058	Hartford, The John A., Foundation...	300,000
Baker, Mrs. Frederick, Pathological			Hill, Margucrite S.....	5,500
Department		8,500	Ingenhron, May A., Memorial Bed...	26,227
Briddon, C. K., Gold Medal.....		2,559	Institute of Ophthalmology, The.....	3,412,942
Brookman, Henry D.....		50,000	Jesup, Morris K. and Maria DeWitt...	100,000
Carle, Robert W. and Adele S.,			Jones, David, Memorial.....	300,000
Endowed Room		50,000	Jones, Margarette A.....	166,255
Cary, Caroline Catherine.....		50,000	Keller Memorial	500
Coakley, Cornelius G.....		665,445	Kennedy, John Stewart.....	1,828,714
Coakley, Cornelius G., Memorial.....		30,000	Kinnicutt, The G. Herman, Flower...	5,000
Colgate, Hannah, Memorial.....		60,794	Knapp, The Herman Memorial Eye	
Collins, Perry McDonough.....		548,999	Hospital Endowed Bed.....	60,375
Columbia University for Vanderbilt			Krumb, Henry	25,000
Clinic and Sloane Hospital.....	1,400,000		Lattimer, Dr. John K.....	64,085
Cook, William W.....	114,849		Lindley, Erasmus C.....	50,000
Cragin Fund	68,819		MacMillin, Isabel, Memorial.....	1,409,359
Davis, Isabel G.....	813,999		Maloy, The Frank and Selena,	
Delano, Moreau	4,000		Memorial	25,000
Department of Surgery Research.....	29,724		Martin, Frederick Townsend.....	10,000
Dodge, The Cleveland H.....	310,500		Maxwell, Anna C., Memorial Library.	7,401
Dortic Memorial	99,024		McCosh, Dr. Andrew J., Memorial...	100,192
Dows, Mrs. David.....	7,700		McCreedy, Jeanne Campbell.....	106,529
Dows, Margaret E.....	5,360		McGuire, Mary Madison.....	260,006
Educational and Scientific Work.....	285,528		Medical Center Development Program	4,105
Eichner, Joseph Herman and Hannah,			Medical Laboratory Development	
in Memory of.....	8,576		Endowment	150,000
Eidlitz, Otto M.....	415,272		Medical Scientific	317,226
Eidlitz, Robert J.....	210,234		Milbank, Dunlevy	1,000,000
Endowed Bed	1,915,905		Miller, Margaret G.....	60,275
Endowed Bed — Research	190,003		Moore, Paul, Research.....	85,000
Faulkner, The Edward Daniels, Me-			Nathan, Garfield Arthur.....	258,981
morial for the Study and Treatment			O'Connor, Fenwick	7,020
of Arthritis	100,000		Ottman, for Cancer Research.....	20,000
Fiske Fund	104,236		Parkin, Alice Temple.....	50,000
FitzGerald, Frederick H. and			Physical Medicine and Rehabilitation	
Josephine F.....	141,363		Service Endowment	100
Flagler, Alice Manderlick.....	250,142		Prostate, Fund for Research.....	1,781
Foote, Edwin Bancroft.....	175,949		Quick, The Walter R.....	15,060
Ford, George W. and Eliza Lawson...	330,911		Research and Development in	
Fracture Endowment Fund.....	10,000		Anesthesiology	79,500
Fremstad, Anna Olivia.....	56,275		Research and Development in Depart-	
General Endowment	274,481		ment of Medicine.....	34,437
Goldschmidt, Henry Philip.....	5,000		Rogers, Henry H., Memorial.....	30,294
Gondran, Sophie M. and Adolph L....	100,000		Sage, Dean, Memorial.....	28,253
Griffith, Griffith W. and Mary Jones,			Sage, Dean, Scholarship.....	7,000
Memorial	1,331,292		Sage, Russell and Margaret Olivia,	
Haller, Maria L.....	2,609		Memorial	878,188
Harkness, Edward S.....	6,188,794		School of Nursing.....	203,230
Harkness, Edward S., Memorial.....	14,000,000		Secor, Mary E.....	42,063
Harkness, Edward S., Research.....	500,000		Sherry, The Bertha, Memorial.....	653,401
Harkness, Mary Stillman, Memorial			Sidman Trust	1,072
Endowment	250,000		Sloane Hospital	783,257

ENDOWMENT FUNDS — Continued

Sloane Hospital Babies' Alumni.....	19,947	Kimball, Reuel B.....	57,738
Sloane Hospital Research.....	25,000	Lambert, Dr. Charles I., Memorial....	11,000
Squier Clinic.....	113,636	McIntosh, Dr. Rustin.....	18,339
Stein, Jules.....	25,000	Rathbone, R. Bleecker.....	15,000
Stilson, Ellen J. and Minnie.....	21,029	Rumson Fund.....	20,470
Stone, William Ridgley, Memorial....	81,033	Videre, Leontine, Foundation.....	9,976
Surgical Fellowship.....	60,000	Wilcox, Herbert B., Memorial.....	2,000
Terry, John T., in Memory of.....	40,767		<u>2,262,461</u>
Tod, J. Kennedy, Memorial.....	100,102		
Tolfree, The Caroline O. and James E., Memorial.....	157,370	NEUROLOGICAL INSTITUTE:	
Urological Service Research.....	23,153	Blair Memorial.....	3,127
Valentine, Isaac E., Memorial.....	563,227	Endowed Bed — Research.....	166,049
Van Norden, Kathryn L.....	2,609	Ogilvie, Clinton, Memorial.....	9,970
Vanderbilt Clinic.....	156,806		<u>179,146</u>
Webster, Dr. Jerome P., Library of Plastic Surgery.....	30,861	NEW YORK ORTHOPEDIC HOSPITAL:	
Weinman, Moses.....	5,360	Bridgman, Statira.....	2,500
Weisl, Alice.....	130,125	Endowed Bed.....	623,343
Welles, Frances Swan.....	10,000	Farrell, Dr. Benjamin P., in Memory of	7,656
Westlake, Emory H. and Caroline B..	27,292	General Endowment.....	833,259
Wheeler, The Dr. John M., Memorial..	73,791	Hibbs, Russell A., Memorial Library..	36,068
Williams, William.....	342,658	Hurst, The Thomas D. and Kate.....	5,000
	<u>48,279,244</u>	Kane, Annie C., Fellowship.....	1,000,000
		Orthopedic Surgery Endowment.....	30,000
THE BABIES HOSPITAL:		Rathbone, R. Bleecker.....	15,000
Cleft Palate Cases.....	8,333	Smith, Dr. Alan DeForest, Lectureship	6,601
Cribside Social Service Committee....	12,828	Tower, Mary T., in Memory of.....	30,569
Educational Therapy.....	1,000	Watson, Emily A.....	2,502,256
Eichner, Joseph Herman and Hannah, in Memory of.....	8,576	White, Emily Vanderbilt.....	20,000
Endowed Bed.....	37,426	Willard, Mary Livingston.....	5,000
General Endowment.....	10,000		<u>5,117,252</u>
Harkness, Edward S., Educational and Scientific.....	600,000	TOTAL ENDOWMENT FUNDS.....	55,838,103
Harkness, Edward S.....	1,199,775		
Harkness, Mary Stillman, Memorial Endowment.....	250,000	PORTION OF ACCUMULATED GAIN FROM POOLED INVESTMENTS SOLD.....	8,779,353
		TOTAL.....	<u>\$64,617,456</u>

ACCOUNTANTS' OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the balance sheet and supporting schedule of endowment funds of The Presbyterian Hospital in the City of New York as of December 31, 1960 and the related statement of income and summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet and schedule of endowment funds and the statement of income and summary of fund changes present fairly the financial position of the Hospital at December 31, 1960 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

New York

February 6, 1961

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the books and accounts of The Presbyterian Hospital in the City of New York for the fiscal year 1960.

We submit herewith after due consideration by this Committee, an opinion of Messrs. Haskins & Sells dated February 6, 1961 relating to the Corporation's balance sheet and schedule of endowment funds as of December 31, 1960 and related statement of income and summary of fund changes for the year then ended, as the results of a satisfactory examination of the said books and accounts. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*
JOHN S. BURKE, JR.
DORRANCE SEXTON
Auditing Committee

New York

February 8, 1961

EXHIBIT E

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly insured by the Travelers Insurance Company. The amounts set aside for retirement benefit purposes, which are not part of the assets of the Hospital, aggregated \$6,062,934 at December 31, 1960. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1960 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1960 of the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1960.....	\$2,175,574
Payments to Fund.....	145,000
Net Income from Investments including Net Profit on Investments Disposed of.....	160,120
	<u>2,480,694</u>
Disbursements for Retirement Benefits.....	78,749
Assets in Fund — December 31, 1960.....	<u>\$2,401,945</u>

Consisting of:	<i>Book Value*</i>
U. S. Government Obligations.....	\$ 54,855
Industrial, Railroad, Public Utilities and Miscellaneous Bonds.....	1,222,365
Government Mortgages	175,061
Preferred Stocks	46,355
Common Stocks	901,143
Cash	2,166
	<u>\$2,401,945</u>

* The cash and approximate market value of the securities held as of December 31, 1960 totaled \$2,776,939.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

By WILLIAM F. LACKMAN,
Vice President

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1960:

Retirement Fund Trust — Morgan Guaranty Trust Company of New York, Trustee	\$2,401,945
Travelers Insurance Company Reserve for Annuities Purchased.....	3,660,989
TOTAL	<u>\$6,062,934</u>

STATISTICS

December 31, 1960

BED COMPLEMENT

	No. Beds	WARD:	No. Beds
PRIVATE:			
Presbyterian Hospital (Harkness Pavilion)	203	Presbyterian Hospital and Sloane Hospital:	
Babies Hospital	3	Medicine	102
Institute of Ophthalmology.....	19	Dermatology	8
Neurological Institute	63	Metabolism	10
Sloane Hospital	23	Surgery	114
Total Private	311	Urology	36
		Orthopedic	67
SEMI-PRIVATE:		Otolaryngology	12
Presbyterian Hospital and Sloane Hospital:		Admitting	14
All Services (Harkness Pavilion)	97	Gynecology	35
Medicine	9	Obstetrics	81
Surgery	14	Babies Hospital (including premature nursery of 23 incubators).....	152
Urology	31	Institute of Ophthalmology.....	37
Orthopedic	55	Neurological Institute	106
Otolaryngology	21	Total Ward	774
Gynecology	13		1,478
Obstetrics	29	MARY HARKNESS CONVALESCENT HOME	33
Babies Hospital	41		1,511
Institute of Ophthalmology.....	36	NEWBORNS (Sloane Hospital).....	113
Neurological Institute	47	Total	1,624
Total Semi-Private	393		

HOSPITAL ADMISSIONS

		Admissions				Admissions	
		1960	1959			1960	1959
PRIVATE:				WARD:			
Presbyterian Hospital (Harkness Pavilion)				Presbyterian Hospital and Sloane Hospital:			
Babies Hospital				Medicine			
Institute of Ophthalmology				Dermatology			
Neurological Institute				Metabolism			
Sloane Hospital				Surgery			
Total Private				Urology			
				Orthopedic			
				Otolaryngology			
				Admitting			
				Gynecology			
				Obstetrics			
				Babies Hospital			
				Institute of Ophthalmology			
				Neurological Institute			
				Total Ward			
				MARY HARKNESS CONVALESCENT HOME			
				Total			
				INFANTS BORN IN SLOANE HOSPITAL:			
				Private beds			
				Semi-private and Ward beds			
				Total			

HOSPITAL OCCUPANCY

	<i>Patient Days Care</i>		<i>Percentage of Occupancy</i>	
	<i>1960</i>	<i>1959</i>	<i>1960</i>	<i>1959</i>
PRIVATE:				
Presbyterian Hospital (Harkness Pavilion).....	72,082	70,732	97.0	95.5
Babies Hospital	699	792	63.7	72.3
Institute of Ophthalmology.....	5,697	6,053	81.9	87.3
Neurological Institute	17,870	15,398	75.2	87.9
Sloane Hospital	6,081	6,077	72.2	72.4
Total Private	<u>102,429</u>	<u>99,052</u>	<u>90.9</u>	<u>91.7</u>
SEMI-PRIVATE:				
Presbyterian Hospital and Sloane Hospital:				
All Services (Harkness Pavilion).....	30,751	30,143	86.6	85.1
Medicine	3,127	2,997	94.9	91.2
Surgery	5,051	5,051	98.6	98.8
Urology	8,685	8,331	76.5	73.6
Orthopedic	15,558	14,215	77.3	70.8
Otolaryngology	5,414	5,429	70.4	70.8
Gynecology	5,715	5,560	120.1	117.2
Obstetrics	5,777	6,773	54.4	64.0
Babies Hospital	14,426	14,137	96.1	94.5
Institute of Ophthalmology.....	12,255	12,576	93.0	95.7
Neurological Institute	16,408	18,286	93.7	102.2
Total Semi-Private	<u>123,167</u>	<u>123,498</u>	<u>85.4</u>	<u>85.7</u>
WARD:				
Presbyterian Hospital and Sloane Hospital:				
Medicine	33,188	33,177	88.9	89.1
Dermatology	2,480	2,561	84.7	87.7
Metabolism	2,793	2,462	76.3	67.5
Surgery	36,235	35,184	86.8	84.6
Urology	11,162	11,799	84.7	89.8
Orthopedic	21,122	20,756	86.1	84.9
Otolaryngology	3,242	3,154	73.8	72.0
Admitting	2,512	2,436	49.0	47.7
Gynecology	11,504	10,794	89.8	84.5
Obstetrics	27,283	27,645	92.0	93.5
Babies Hospital	44,865	43,063	80.6	77.6
Institute of Ophthalmology.....	8,050	8,696	59.4	64.4
Neurological Institute	28,136	26,117	73.1	68.8
Total Ward	<u>232,572</u>	<u>227,844</u>	<u>82.2</u>	<u>80.9</u>
MARY HARKNESS CONVALESCENT HOME.....	10,007	10,631	82.9	86.1
Total	<u>468,175</u>	<u>461,025</u>	<u>84.8</u>	<u>84.4</u>
INFANTS BORN IN SLOANE HOSPITAL:				
Private beds	4,705	4,594	55.9	54.7
Semi-private and Ward beds.....	22,309	22,588	67.7	68.8
Total	<u>27,014</u>	<u>27,182</u>	<u>65.3</u>	<u>65.9</u>

OUT-PATIENT DEPARTMENT STATISTICS

	1960	1959
Summary of Patients Treated:		
Number of patients treated.....	63,247	66,699
Number of visits:		
Free	106,419	110,563
Pay	295,450	310,901
Total	401,869	421,464
Average visits per working day.....	1,588	1,653
	<i>New to Clinics</i>	<i>Total Visits</i>
Attendance Statistics:		
Dermatology	6,299	23,448
Emergency and Admitting Wards.....	24,077	4,811
Group Clinic	3,608	22,507
Medicine	3,811	34,213
Neurology	3,117	14,171
Obstetrics and Gynecology.....	7,424	35,318
Occupational Therapy	3	381
Ophthalmology	4,197	22,180
Orthopedic	12,240	25,030
Otolaryngology	5,174	14,104
Pediatrics	6,626	38,794
Physical Therapy	1,366	16,466
Psychiatry	718	7,143
Surgery	25,857	28,291
Urology	1,783	8,712
Total	106,300	295,569

PERSONNEL STATISTICS

	<i>On Duty December 31</i>	
	1960	1959
Administration	11	12
Assistant Secretary-Treasurer	58	44
Comptroller	100	100
Public interest	14	11
Convalescent Home	30	32
Non-professional services:		
Buildings and grounds.....	577	591
Food service	379	382
Personnel and protective.....	80	79
Other non-professional services.....	178	181
Professional services:		
Nursing	1,324	1,269
Professional staff, doctors' offices and research.....	395	392
Special services	477	470
Vanderbilt Clinic and other.....	258	264
Total	3,881	3,827
Student Nurses	448	394
Volunteer Workers	444	460

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1960

ASSETS		FUNDS AND LIABILITIES	
CURRENT FUNDS ASSETS:		CURRENT FUNDS AND LIABILITIES:	
Cash	\$ 269,463	Accrued expenses	\$ 15,679
U. S. Treasury Bills.....	960,172	Special expendable funds.....	118,279
		General fund	1,095,677
Total current funds assets.....	<u>1,229,635</u>	Total current funds and liabilities..	<u>1,229,635</u>
ENDOWMENT FUNDS ASSETS:			
Cash	35,118		
U. S. Treasury Bills.....	2,465,132		
Total endowment funds assets....	<u>2,500,250</u>	ENDOWMENT FUNDS	<u>2,500,250</u>
TOTAL	<u><u>\$3,729,885</u></u>	TOTAL	<u><u>\$3,729,885</u></u>

NOTE:

The above corporation was established on January 21, 1960, to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

As of December 31, 1960 contributions and pledges to the Development Program of the Columbia-Presbyterian Medical Center amounted to \$17,652,489. These contributions and pledges have been made to Columbia University, Presbyterian Hospital and the Columbia-Presbyterian Medical Center Fund, Inc.

In addition to the funds held by the Columbia-Presbyterian Medical Center Fund, Inc., as shown in the balance sheet above, Presbyterian Hospital held \$647,886 and Columbia University held \$6,082,443 on December 31, 1960.

THE ALUMNAE ASSOCIATION OF THE
SCHOOL OF NURSING OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK

BALANCE SHEET

December 31, 1960 and 1959

ASSETS

	<i>1960</i>	<i>1959</i>
Capital Funds — securities and cash.....	\$805,443.06	\$781,830.12
Operating Funds — securities, cash, etc.....	14,718.12	10,510.99
Total Assets	<u>\$820,161.18</u>	<u>\$792,341.11</u>

LIABILITIES

Capital Fund Reserves:		
General fund	\$ 15,918.15	\$ 17,808.20
Benefit fund	163,628.04	159,719.18
Pension fund	551,494.03	534,013.86
Scholarship funds:		
M. Elizabeth Deans Howell fund.....	505.44	502.84
Emma B. Kennedy fund.....	28,333.50	26,785.05
Memorial fund, '20.....	2,966.98	2,528.09
June Moore fund.....	402.17	400.00
Richard William Walsh fund.....	2,097.31	2,085.60
Ruth C. Williams fund.....	2,779.50	2,664.75
Helen Young fund.....	37,317.94	35,322.55
Total capital fund reserves.....	<u>805,443.06</u>	<u>781,830.12</u>
Operating Funds Reserve.....	14,718.12	10,510.99
Total Liabilities	<u>\$820,161.18</u>	<u>\$792,341.11</u>

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

Cash on Hand January 1.....	\$ 6,135.81	\$ 10,321.34
Receipts:		
Sale of securities.....	15,985.33	25,197.17
Investment income	43,780.27	41,721.85
Donations	11,651.56	14,162.98
Dues and initiation fees.....	10,526.98	10,353.66
Dinner to graduating class.....	189.00	347.00
Loans repaid, etc.....	1,282.00	1,487.35
Total Receipts	<u>83,415.14</u>	<u>93,270.01</u>
	89,550.95	103,591.35
Disbursements:		
Purchase of securities.....	36,346.00	62,046.25
Clerical expense and fees.....	6,033.50	5,794.00
Pensions and benefits paid.....	20,484.00	15,248.00
Scholarships granted	2,700.00	2,400.00
Loans granted	100.00	
Donations	25.00	187.50
Printing, stationery and postage.....	10,141.15	7,361.78
Entertainment of graduating class.....	2,176.40	2,312.64
Miscellaneous	2,288.13	2,105.37
Total Disbursements	<u>80,294.18</u>	<u>97,455.54</u>
Cash on hand December 31.....	<u>\$ 9,256.77</u>	<u>\$ 6,135.81</u>

HELEN YOUNG, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

FOR THE AUXILIARY

For the Years 1960 and 1959

	<u>1960</u>	<u>1959</u>
Balance, January 1.....	\$ 2,539.18	\$ 4,288.18
Receipts:		
Membership dues	570.00	530.00
Donations	650.00	50.00
United Hospital Fund:		
Free Care Distribution.....	4,920.00	4,252.53
Direct Benefit	6,961.00	5,787.00
Greater New York Fund.....	5,635.00	7,197.47
Total Receipts	<u>18,736.00</u>	<u>17,817.00</u>
	<u>21,275.18</u>	<u>22,105.18</u>
Disbursements:		
To Babies Hospital for:		
Care of Ward and Clinic Patients.....	6,961.00	5,787.00
Emergency Nursing	7,500.00	5,500.00
Pediatric Psychiatric Clinic.....	1,500.00	1,500.00
Recreational Therapy	4,500.00	4,500.00
Volunteer service	500.00	500.00
House Staff Loan Fund.....		1,500.00
Christmas Dolls and Toys.....	250.00	250.00
Miscellaneous	25.18	29.00
Total Disbursements	<u>21,236.18</u>	<u>19,566.00</u>
Balance, December 31.....	<u>\$ 39.00</u>	<u>\$ 2,539.18</u>

MARY S. B. BRAGA, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS
 FOR THE CRIBSIDE SOCIAL SERVICE COMMITTEE
 For the Years 1960 and 1959

	<u>1960</u>	<u>1959</u>
Balance, January 1	\$ 7,648.03	\$12,662.95
Receipts:		
Membership dues	250.00	265.00
Donations	295.00	140.00
United Hospital Fund.....	7,301.00	6,192.73
Greater New York Fund.....	7,905.00	9,804.27
Investment income	754.92	671.28
Bargain Box Thrift Shop.....	8,474.38	7,324.93
Sewing Class dues and receipts.....	405.32	345.17
Repayments by patients of advances and loans.....	348.50	351.00
Total Receipts	<u>25,734.12</u>	<u>25,094.38</u>
	<u>33,382.15</u>	<u>37,757.33</u>
Disbursements:		
Social service salaries.....	20,761.74	24,483.54
Travel of social service staff.....	100.77	103.68
Conference expenses, dues, subscriptions and meetings.....	169.69	37.00
Camping for handicapped children.....	875.16	807.15
Advances to patients for convalescent care and miscellaneous loans.....	348.50	351.00
Relief assistance and extra for patients:		
Clothing	712.66	1,166.66
Milk and food.....	303.00	411.02
Christmas and Thanksgiving.....	255.59	308.46
Other	69.50	134.30
To Babies Hospital for:		
Emergency Nursing	500.00	
Social Service Scholarships.....	810.00	2,300.00
Miscellaneous	98.39	6.49
Total Disbursements	<u>25,005.00</u>	<u>30,109.30</u>
Balance, December 31.....	<u>\$ 8,377.15</u>	<u>\$ 7,648.03</u>

EDITH FENNELLY, *Chairman*

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1960 and 1959

	1960	1959
Balance, January 1.....	\$14,286.45	\$12,342.42
Receipts:		
Membership dues	370.00	335.00
Donations	1,065.00	1,400.00
United Hospital Fund:		
Free Care Distribution.....	10,625.00	8,949.09
Direct Benefit	6,024.00	7,243.00
Greater New York Fund.....	12,171.00	15,139.91
Everybody's Thrift Shop.....	17,144.13	14,692.05
Repayments by patients of advances and loans.....	237.15	536.82
Total Receipts	47,636.28	48,295.87
	61,922.73	60,638.29
Disbursements:		
Social service salaries.....	23,596.09	24,062.55
To Neurological Institute for:		
Care of Ward and Clinic Patients.....	6,024.00	7,243.00
Library	2,640.13	2,498.80
Special Nursing Fund.....	3,000.00	2,500.00
Volunteer service	1,900.00	1,900.00
Advances to patients for summer therapeutic care and miscellaneous.....	237.15	536.82
Summer therapeutic care.....	2,064.00	2,458.00
Chronic care	809.85	869.51
Convalescent care		94.23
Medical relief	1,451.81	3,441.76
Staff travel, field and conference.....	60.39	20.56
Miscellaneous, postage, telephone and publications.....	556.08	726.61
Total Disbursements	42,339.50	46,351.84
Balance, December 31.....	\$19,583.23	\$14,286.45

HELEN L. WEINBERG, *Chairman*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1960 and 1959

	1960	1959
Balance, January 1.....	\$23,295.79	\$15,901.72
Receipts:		
Donations	7,204.00	14,308.38
Investment income for use in Recreational Therapy	1,386.61	
United Hospital Fund Direct Benefits.....	17,011.00	13,558.00
Allocation from United Hospital Fund and Greater New York Fund		
Distribution	4,000.00	4,000.00
Other (Portrait Show).....	4,228.83	
Total Receipts	33,830.44	31,866.38
	57,126.23	47,768.10
Disbursements:		
Recreational therapist salary.....	6,645.54	5,822.52
Other recreational therapy expenses.....	1,062.32	992.14
To Presbyterian Hospital for:		
Care of Ward and Clinic Patients.....	17,011.00	13,558.00
House Staff Loan Fund.....	1,000.00	1,000.00
Library	1,179.99	1,132.92
Volunteer service	1,100.00	1,100.00
Scholarship Aid for Graduate Nurses.....	500.00	500.00
Miscellaneous	176.30	366.73
Total Disbursements	28,675.15	24,472.31
Balance, December 31.....	\$28,451.08	\$23,295.79

VIRGINIA S. HUTTON, *Treasurer*

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1960 and 1959

	<i>1960</i>	<i>1959</i>
Balance, January 1	<u>\$ 3,369.51</u>	<u>\$ 4,003.21</u>
Receipts:		
Membership dues	675.00	697.50
United Hospital Fund:		
Free Care Distribution	6,696.00	5,727.36
Direct Benefit	6,577.00	6,731.00
Greater New York Fund	7,670.00	9,693.64
Donations	50.00	65.00
Stuyvesant Square Thrift Shop	8,039.04	6,704.32
Other (Manhattan House Tour Benefit)		2,098.17
Total Receipts	<u>29,707.04</u>	<u>31,716.99</u>
	<u>33,076.55</u>	<u>35,720.20</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic Patients	6,577.00	6,731.00
Occupational Therapy	6,000.00	6,000.00
House Staff Loan Fund	1,800.00	3,500.00
Library	7,215.62	6,964.85
Social Service Staff Development Fund	400.00	
Scholarship Aid to Student Nurses		1,000.00
Volunteer service	7,200.00	7,200.00
Miscellaneous	373.51	954.84
Total Disbursements	<u>29,566.13</u>	<u>32,350.69</u>
Balance, December 31	<u>\$ 3,510.42</u>	<u>\$ 3,369.51</u>

NANCY V. BARRETT, *Treasurer*

Endowed Beds

(1) A gift of \$10,000 shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special service) for not more than ninety days in any one year.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment, and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objects for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as a permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the Executive Vice President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and Executive Vice President of the Hospital) at the time the nomination is made.

Endowed Beds and Rooms

Presbyterian Hospital

- 1868 Mary J. Gelston
- 1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore
- 1871 John Laurie
Mary Ann Parish
- 1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhineland
- 1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York
- 1884 Nathaniel W. Conkling
West Presbyterian Church, to be known as
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane
- 1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin
- 1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Edward L. Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother,
Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
O. B. Jennings

- Mrs. John Stewart Kennedy
 Amelia Kerr
 Robert Marshall
 Elizabeth S. and Emily M. Wheeler, in memory of
 James Boorman
 "The Davenport Bed"
- 1891 Sarah A. Havemeyer, in memory of her son,
 Hector C. Havemeyer
 Thomas Hope
 John E. Parsons, in memory of his children,
 E. L. P., K. M. P., and R. M. P.
 Mrs. A. R. Van Nest, in memory of her husband,
 Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
 Emma Stewart Baker
 Alexander Maitland, in memory of his mother,
 Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
 Edgar S. Auchincloss
 Frances T. Lord, in memory of her husband,
 George deForest Lord
 Presbyterian Church on University Place
 Presbyterian Home for Aged Women
 Margaret A. Sinclair, in memory of
 Mr. and Mrs. James Sinclair
 West-Park Presbyterian Church
 Young Men's Christian Association
- 1895 Mary Harrison
 Mrs. Clarence M. Hyde, in memory of her mother,
 Rebecca Babbitt
 John Stewart Kennedy, in memory of
 Mrs. Robert L. Stewart
 Mrs. James T. Murray, in memory of her husband,
 James T. Murray
- 1896 Anthony Dey, in memory of Joseph G.
 and Eliza D. Scott
 Jane Hope
 Esther J. Jennings, in memory of her husband,
 Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
 James Rich Steers
 William S. Brown
 Helen Miller Gould, in memory of her parents,
 Mr. and Mrs. Jay Gould
 Margarette E. and Susan D. Griffith, in memory of
 their father, Griffith W. Griffith
 Mary J. Griffith, in memory of her husband,
 Griffith W. Griffith
 Rachel L. Kennedy, in memory of her mother,
 Mrs. Rachel C. Kennedy
 Annie S. Paton, in memory of her husband,
 William Paton
 Charlotte H. Skidmore, to be known as
 "The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
 Matilda A. Brown, in memory of her son,
 H. Auchincloss Brown
 First Presbyterian Church
 Mrs. Stephen V. Harkness, in memory of her
 daughter, Florence Harkness
 Jane Hope, in memory of her mother,
 Grace Corrie Hope
- John Stewart Kennedy, in memory of
 Rev. William G. Schauffler, D.D., LL.D.
 Mrs. Elliott F. Shepard, in memory of her
 daughter, Florence Vanderbilt Shepard
 Mrs. Elliott F. Shepard, in memory of her
 daughter, Marguerite Shepard
- 1899 William W. Cole, in memory of his mother,
 Mary A. Cole
 William Whitewright, in memory of his father,
 William Whitewright, "The Whitewright Beds"
 (10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
 Moses Hopkins, "Moses Hopkins Memorial"
 Donald MacKay, in memory of his children,
 Edith Winslow and Walter Wise MacKay
 Caroline L. Macy, in memory of her daughter,
 Mary M. K. Willets
 Laura Roome, in memory of her sons,
 Harry and Alfred Roome
 Martha L. St. John, in memory of her mother,
 Sarah Ward
 Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
 Frederick Billings
 Camilla L. Edwards, in memory of her husband,
 Walter Edwards
 Andrew J. Garvey, in memory of his mother,
 Elizabeth Jeffries Garvey (2 Beds)
 George Lauder
 Charles H. Marshall
 Justine Adele Stafford, in memory of her father,
 Justin A. Bliss
- 1902 Robert Graham Dun
 Margaret J. Plant, in memory of her brother,
 Simon Loughman
- 1903 Heber R. Bishop
 Lura Currier
 Mrs. Francis B. Harrison
 Julia J. MacCartee, in memory of her husband,
 Robert MacCartee
 Madison Avenue Reformed Church
 Adele Berry Sloane, in memory of her father,
 Abraham J. Berry, M.D.
 Justine Adele Stafford, in memory of her mother,
 Eveline C. Bliss
 John T. Terry
- 1904 Virginia E. Fowler, in memory of
 Clarence E. Fowler
 Susan Bevier
 Mrs. William Starr Miller
 Josephine Penford, in memory of
 Dr. Edward Livingston Trudeau, Jr.
 Peter Reid, in memory of his wife,
 Jane Watson Reid
 Francis A. Palmer
- 1905 Frederick G. Bourne
 Helen C. Inslee, in memory of her husband,
 Samuel Inslee
 Titus B. Meigs, in memory of his son,
 Titus B. Meigs, Jr.
 Mrs. James T. Murray, in memory of
 Rev. John Hall, D.D., LL.D.
 Sarah J. Parsons, in memory of her husband,
 Charles Parsons
 Presbyterian Church on University Place

- 1906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
Susan W. Duncan, in memory of her husband,
John P. Duncan
Samuel Keyser (3 Beds)
Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
Reformed Protestant Dutch Church of
Garden Street
John Sloane, in memory of his brother,
Thomas Chalmers Sloane
John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
Samuel Anthony Goldschmidt, in memory of
his mother, Celestine Goldschmidt
Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory of
"Minnie and Willie"
Canadian Society of New York
Edward West Currier, in memory of his
stepmother, Laura Currier
Edward West Currier, in memory of his
stepbrother, Walter B. Currier
Edward West Currier, in memory of
Edward W. Currier
Mary Jane Johnson, in memory of her husband,
William H. Johnson
J. Theresa Keyser, in memory of her husband,
Samuel Keyser
Julia Hannon Lyle
Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
Jane A. Townsend, in memory of her son,
Harmon W. Norton
Jane A. Townsend, in memory of her daughter,
Emma L. Norton
Amelia Mott Graham, in memory of
Malcolm Graham
Adeline Ives Latham, in memory of her husband,
John Howard Latham
Josephine G. Lord, in memory of her husband,
Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck,
"Madam Beck Memorial Teacher's Bed"
Harriet Coles, in memory of her sisters,
Susan and Anna Codman
Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
Reformed Low Dutch Church of Harlem
Frederick Sturges, in memory of his father,
Jonathan Sturges
William Stuart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in Children's Ward,
"Emma de Wolf Bed"
Gustavia A. Senff, in memory of her husband,
Charles A. Senff
Mrs. Christopher M. Bell, "The Dennistoun Bed"
Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpentier Memorial" (3 Beds)
Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
Josephine Penfold
Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
William H. Penfold, in memory of
Josephine Penfold
Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
Minnie Hackett Trowbridge (6 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
A Friend
Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
Central Presbyterian Church
Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "Chalmers
Memorial Bed"
Robert A. Chambers, in memory of his father,
Robert Chambers
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Sarah C. Miller
Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as
"Leora McCammon Bed"
- 1919 Samuel Elliott
Elizabeth Keys, in memory of her daughter,
Edith Keys
Rutgers Presbyterian Church
James R. Steers, in memory of his former wife,
Rebecca E. Steers
John W. Sterling
- 1920 William C. Boschen, to be known as the
"Boschen Bed"
Rosa Franklin (4 Beds)

- Francis P. Furnald
Mrs. Francis P. Furnald
Mary A. Harriot, to be known as the
"Margaret Harriot Alms"
Mary A. Harriot, to be known as the
"James Harriot Alms"
Mrs. Henry O. Havemeyer, in memory of her
parents, George William and Matilda Adelaide
Elder
Margaret J. Orr, in memory of her mother,
Ann Boyd Orr
Anna St. John, in memory of her brother,
Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the
"Sidney Dillon Bed"
Henry M. Gescheidt
Ralph E. Prime, in memory of his daughter,
Ruth Havens Prime
Joseph K. Gwynn
Charles S. Ward, in memory of his friend,
Sophie L. Kinman
Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
Christina C. Munro, in memory of her husband,
John Munro
Anna M. Romaine, in memory of
Dr. William I. Detmold
Arnold Thayer (2 Beds)
Hamilton B. Tompkins, in memory of his wife
and himself
- 1923 Lydia Augusta Brown
Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
Cordelia F. Turrell
Nannie Gyles Johnson (Children's Ward),
in memory of her son, Shirley Everton Johnson
Mrs. William John Fitzgerald
- 1925 Christina Bond
In memory of Julia C. Skidmore
George Clarke
Elizabeth J. Hofer (2 Beds)
In memory of Catherine Parke and
Horatio C. Kretchmar
Edward M. Morgan Memorial Association
(4 Beds)
In memory of Edward M. Morgan
Jennette Robertson, to be known as
"Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as
"E. E. Auchincloss, Jr. Bed"
Members of the New York Stock Exchange,
to be known as the "Seymour LeGrande
Cromwell Memorial" (2 Beds)
Edmund Penfold, in memory of
Josephine Penfold and William Hall Penfold
(2 Beds)
Dr. M. Allen Starr, in memory of
Allen Egbert Starr
John B. Trevor, in memory of Emily N. Trevor
West End Collegiate Church
George D. Widener
- 1927 Second Presbyterian Church in the
City of New York
Ellen Mills Borne, in the Children's Ward,
to be known as "John E. Borne Bed" and
"Nellie M. Borne Bed" (2 Beds)
Virginia Marquand Monroe, in the name of the
Young Men's Christian Association
Mrs. Charles H. Senff, to be known as
"Dr. George A. Tuttle Bed"
W. Frazer Gibson, in memory of his mother,
Jeanette Frazer Gibson, to be known as
"Jeanette Frazer Gibson Bed"
Augustus C. Gurnee, in memory of his mother,
Mary M. Gurnee (2 Beds)
Eliza V. Nicholson
Mrs. Murray W. Dodge and Mrs. Franklin Lord,
in memory of their mother,
Mrs. Fordyce D. Barker (Single Ward Room)
Dunlevy Milbank (Single Ward Room)
F. Ethel Wickham, in memory of her father,
William Hull Wickham, to be known as "William
Hull Wickham Bed" (Single Ward Room)
Anna A. Johnston, in memory of her parents,
William G. and Adriana C. Gardner
Anna A. Johnston, in memory of Lewis, Anna,
Edward and Mary Johnston (Single
Ward Room)
Broadway Presbyterian Church, to be known as
the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
In memory of McKevers Bayard Brown
(Single Ward Room)
Caroline B. Sellev (4 Beds)
Red Cross Rooms for Nurses
(3 Single Ward Rooms)
Robert W. deForest (Single Ward Room)
Henry W. deForest (Single Ward Room)
James R. Steers
Jane Livingston Armour, in memory of
John A. Livingston
Jane Livingston Armour, in memory of
Herman O. Armour
In memory of Meredith Howland Pyne
Stella C. and Roi C. Megrue (Single Ward Room)
Mrs. E. C. Wills, in memory of her mother,
Mrs. J. F. Ackerman, and her sister,
Mrs. W. Clarence Rced
- 1929 Caroline White, in memory of her sister,
Eliza W. White
Elizabeth A. Hays, in memory of William and
Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
The Presbyterian Church in the Town of
Rye, New York
Mrs. Arthur E. Lauderbach, in memory of her
mother and father, Esther Hull Jackson and
Peter A. H. Jackson
Mary L. Walker Peters, to be known as "The
Charles Grenville Peters and Mary Walker
Peters Free Bed"
Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of Adolph
Obrig and Clara Beales Obrig (Single Ward
Room)
Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole

- 1932 In loving memory of Justine Adele Stafford (Mrs. W. F. Stafford) by her sister, Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance, in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and her brother, Robert F. Adams (Single Ward Room)
Josephine Leypoldt, in memory of her brothers, Louis and Frederick Leypoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father, Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as "The Elizabeth P. Hewes Bed"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
Mary S. Thayer, to be known as "The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as "The Gamble Bed," in memory of her father and mother
Jeremiah Milbank, in memory of his father, the late Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed," in memory of her parents, Rev. C. C. Goss and Theodosia C. Goss
Annie Miller, to be known as "The Mrs. Alexander Miller Memorial Bed," in memory of her mother, Mrs. Alexander Miller
Bertha H. Minturn, in memory of her most faithful and beloved nurse, Mary Humphries
Henry T. Sloane, to be known as "The Euphemia Sloane Coffin Bed," in memory of his sister, Euphemia Sloane Coffin
- 1939 "In Memoriam"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the "Therese K. Thorne Bed," in memory of her mother
Cornelia Livingston Pell, in memory of Alfred Duane Pell
Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as "The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William Darrach Bed"
John Fraser, in memory of his parents, Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother, to be known as the "Cornelia Willets Carle Bed" for general hospital use including harelip and cleft palate cases
- 1947 W. and J. Sloane
Frederick Sturges, Jr., Mrs. Mary Armit Sturges, Mrs. Catharine Armit Chapman and Frederick Sturges, III, in memory of Frederick Sturges
Walter S. Gifford, in memory of his son, Walter Sherman Gifford, Jr.
Ida L. Darling, known as the "Richards Memorial Bed"
- John Sloane, in memory of his wife, Elsie Nicoll Sloane, to be known as the "Elsie Nicoll Sloane Bed"
- Elisa Smith Mabon, in memory of her husband, James Brown Mabon
- 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Shearman
- 1950 Isabel Shields Kemp, to be known as "Mary M. Shields and the Dr. Robert Coleman Kemp Free Bed"
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as the "Charlotte Higbee Kelsey Bed"
W. Alton Jones Foundation, Inc., to be known as the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the "M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidlitz to be known as the "Marc Eidlitz Bed"
Mrs. John S. Holbrook, in memory of her parents, John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black to be known as the "Aurie Dell Black Bed"
Robert W. Carle to be known as the "Adele Skiddy Carle Bed"
Estate of Adolph Riesenbergl to be known as "The Adolph and Anna A. Riesenbergl Bed"
- 1957 George F. Cahill, M.D., to be known as the "Endowed Bed for Personnel of the Squier Urological Clinic"
Edward H. Carle, in memory of his father, to be known as the "John J. Carle Bed"
Mrs. William J. Demorest, in memory of her parents, Wealthy H. Lewis and Richard James Lewis
Chancellor Kent Lodge 870, Free and Accepted Masons, in memory of George J. Weissman
Morris Morgenstern Foundation, to be known as the "Sadie B. Morgenstern Bed"
Estate of Mary Ross Potter, to be known as the "Georgianna Morley Bed"
Estate of Mathilde S. Sterne, to be known as the "Simon Sterne Beds" (4 Beds)
Board of Trustees of The Presbyterian Hospital in honor of and to be known as the "Charles P. Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the "Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
Mrs. Stanley G. Mortimer, to be known as the "Stanley G. Mortimer Bed," in memory of her husband
Mrs. John S. Thacher, to be known as the "Alice E. Baker Bed," in memory of her mother
- 1960 Estate of Exerene L. Flood, to be known as the "Dr. George Ballery Flood Endowed Bed"
Minister, Elders and Deacons of The Reformed Protestant Dutch Church of The City of New York, to be known as "The May A. Ingenthron Memorial Bed"

- Estate of James Miller, to be known as the
"A. Miller Endowed Bed"
Estate of Joan D. Sanger, to be known as the
"Bertram J. Sanger Endowed Beds" (2 Beds)

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

- 1948 Mrs. William Barclay Parsons, in memory of her husband, William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be known as the "Muriel Jane Rudinger Bed"
1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
1952 John F. Bush Memorial Bed
Estate of Selma Boyd, each to be known as a "Boyd Bed" (2 Beds)
Bruce Barton, in memory of his wife, to be known as the "Esther Randall Barton Memorial Bed"
1953 Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
W. Alton Jones Foundation, Inc., in memory of Mamie W. Marvin
1954 Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's father, Doctor Charles Lathrop Parsons
John Shepard Parke Memorial Bed
Mr. and Mrs. Sidney J. Weinberg, in memory of their parents
1955 Bruce Barton, in memory of Clyde Scott and Helen Barton Stilwell, to be known as the "Clyde Scott and Helen Barton Stilwell Memorial Bed"
George F. Cahill, M.D., Research Bed in the Department of Urology
Mr. and Mrs. Charles P. Cooper, in memory of Mrs. Cooper's mother, Mrs. Charles Lathrop Parsons
Herman Goldman Foundation, Inc., in memory of Theresa and Frank Goldman
Williams-Adler Foundation Bed
1959 "John Shepard Parke Memorial Bed"

ENDOWED ROOMS

- 1903 Henry H. Rogers
1905 Mrs. Morris K. Jesup, to be known as the "Eliza De Witt Memorial Room"
1910 Mrs. John Stewart Kennedy, in memory of her husband, to be known as the "J. S. K. Memorial Room"
1912 Peter Cumming, to be known as "Peter Cumming Memorial Room"
1926 Alumnae Association of the School of Nursing of The Presbyterian Hospital, to be known as the "Amabel G. Roberts Memorial Room"
1928 Mrs. William Sloane, to be known as "The William Sloane Room for Graduate Nurses"
1930 The Sarah A. Hard Taylor Memorial Fund, to be known as "The Sarah A. Hard Taylor Room"
1935 Mrs. Herbert Neal, in memory of her husband, James Norman Hill
1937 S. Augusta Mora, in memory of her husband, Frank Mora and mother, Sarah Robson Van De Water

- 1960 Mr. and Mrs. Robert W. Carle, to be known as "The Robert W. and Adele S. Carle Endowed Room"

Babies Hospital

- 1892 The Cribside Committee, known as "Cradyl-Nyst"
1894 Miss Ellen James Evans
Mrs. Henry G. Trevor
1895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of Georgiana Arnold
1897 Mr. and Mrs. Charles M. Fry, known as the "Mr. and Mrs. Charles M. Fry Bed"
Mrs. George Kemp, "For the use and purposes of the Hospital"
1898 Mrs. Oliver G. Jennings, known as the "Brewster Bed"
1899 Mr. and Mrs. John Sherman Hoyt, in memory of John Sherman Hoyt, Jr.
1900 Mrs. Elizabeth Chamberlin Lockwood, in memory of Emily Beaver Chamberlin
1902 Mr. and Mrs. W. E. Dodge, in memory of Grace Osborn
Henry P. Wertheim, in memory of Clara W. Wertheim
1904 Mr. and Mrs. George Arents, in memory of George Arents Brown
Estate of Mrs. Charles Harvey Hartman
1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, known as the "Julia Lamont Bed"
1907 The Cribside Committee
1908 Arthur W. Butler, in memory of Elizabeth Marshall Butler
1910 Dr. and Mrs. L. Emmett Holt, in memory of Kenneth M. Holt
Edwin Clarence Moller, in memory of Peter Moller
1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of David Bradley Martin
1912 In loving memory of J. Bradley Cumings, endowed by his friends. "Greater love hath no man than this, that a man lay down his life for his friends." — *St John 15:13*
1914 Mrs. Andrew Carnegie, in memory of Archibald Fraser Barrow
Mrs. Robert W. Todd, known as the "Mabel Todd Bed"
1916 Mr. and Mrs. John Chandler Moore, in memory of Edward de Bébian Moore
Mrs. John Hubbard, in memory of Margaret Fahnestock
Mrs. Clarence M. Hyde, known as the "Clara Mathewson Hyde Bed"
1917 Harris Brisbane Dick, known as the "Harris Brisbane Dick Free Bed"
Mrs. Edward S. Harkness, known as the "Thomas Stillman Taylor Bed"
Mr. and Mrs. Walter A. Hirsch, in memory of John Walter Hirsch

- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of their daughter, Anna Kate Bartlett
Mrs. John Jay Knox, in memory of John Jay Knox
Mrs. John Jay Knox, in memory of Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, "A thanks offering for Louise Carnegie Miller"
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, "In loving memory of Marie Louise Nichols"
- 1929 Estate of Julia M. Stout
- 1930 Edith C. Thompson, in memory of her mother, Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his children, Daniel Schnakenberg, Jr., and Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her stepdaughter, Susie Sanford Hornblower
- 1949 Dr. Frederic H. Bartlett, "Endowed in loving memory of Frederic H. Bartlett, M.D., 1872-1948, by his patients and other friends to commemorate his many years of faithful service in Babies Hospital"
- 1950 Estate of Emelyn L. Coolidge, in memory of Marianna Wheeler and Emelyn L. Coolidge, M.D., to be known as "The Wheeler-Coolidge Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her mother, Ernestine Schaffner

Neurological Institute

- 1929 Red Cross Endowed Bed for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband, Allen Starr
- 1959 Mr. Jack J. Dreyfus, Jr., to be known as the "Jack J. Dreyfus, Sr. Bed," in honor of his father

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

- 1952 Estate of John Bahrenburg, in memory of John H. Bahrenburg and Elizabeth Bahrenburg (16 Beds)

New York Orthopedic Hospital

- 1883 Miss C. B. Hicks, continued in perpetuity by Buchanan Winthrop
- 1886 Mrs. Elizabeth Milbank Anderson, in memory of J. Milbank Anderson (4 Beds)
- 1891 Alfred Corning Clark (3 Beds)
Edward Severin Clark, to be known as the "Edward Severin Clark Beds" (2 Beds)
Mrs. Henry S. Winthrop

- 1893 Mrs. William D. Sloane, in memory of William Douglas Sloane, Jr.
James K. Gracie, in memory of Anna Bulloch Gracie
Miss Sarah B. Gibbs
- 1894 Mrs. Richard Tylden Auchmuty, in memory of Richard Tylden Auchmuty (2 Beds)
James H. Jones
- 1896 Mrs. William Astor, in memory of Helen Roosevelt
Mrs. Evan T. Walker, in memory of John J. Walker
- 1897 Mrs. William D. Sloane, one bed in memory of Maria Louise Vanderbilt and one in memory of Emilie Vanderbilt Burden
- 1898 Mrs. Charles B. Alexander, for her daughter, named the "Harriet Alexander Bed"
- 1901 Mrs. N. A. Baldwin, in memory of Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of Benjamin Brewster
Henry T. Sloane, Jessie and Emily Sloane, bed endowed by their father
Mrs. Marion Story, in memory of M. Furman Hunt
- 1902 James Henry Smith, in memory of George Smith (2 Beds)
Miss Emily A. Watson, in memory of Mrs. Mary J. Walker
- 1904 Miss Cornelia Prime, in memory of her brother, Temple Prime
Miss Helen Phipps
James K. Gracie, in memory of Esther Gracie Ogden
- 1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of Maurice Dwight Collier
- 1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and Orson D. Munn, in memory of Henry Norcross Munn
- 1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father, Dr. Edward A. Smith, and her mother, Rebecca Miller Smith
- 1913 Estate of Marion de Forest Clark, in memory of Julian Bouton Clark
An anonymous donor, to be known as "Mary Townsend Cuyler Bed"
Carolina F. Butterfield, in memory of Frederick Falconer Butterfield
- 1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as "The Louise Bed"
George Grant Mason, in memory of his uncle, James Henry Smith (2 Beds)
- 1916 Henry M. Tilford, in memory of Catharine Hunt Tilford
Estate of Miss Clementine Furniss, to be known as the "Clementine Furniss Bed"
An anonymous donor
- 1917 Mrs. Charles H. Senff, in memory of her little son, Henry Senff

- Mrs. A. Murray Young, in memory of her great uncle, Wilson G. Hunt
- 1919 R. Fulton Cutting, to be known as the "Helen Suydam Cutting Bed"
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of Anna Livingston Morton
Miss Georgiana G. R. Wendel, "In Memory of My Sister, Augusta A. S. Wendel" (2 Beds)
Various donors, in memory of Theodore Roosevelt
- 1920 Mrs. John Hobart Warren
- 1921 Mrs. Winthrop W. Aldrich, in memory of her little son, Winthrop Williams Aldrich, Jr.
F. Ambrose Clark, to be known as "The Florence L. Clark Bed"
- 1922 Mrs. David T. Dana, in memory of her mother, Mrs. M. Dwight Collier
- 1924 Estate of Charlotte Bruce Bickmore, in memory of Albert Smith Bickmore, Jr.
Mrs. Louise Ward McAlister Lewis, in memory of her mother
- 1925 Miss Elizabeth J. Hofer, in memory of Horatio C. Kretchmar (2 Beds)
Percy Chubb, in memory of his wife
Junior Red Cross of the Public Schools of New York
Mrs. Douglas Robinson, in memory of her friend, Charles Allen Munn
- 1926 Junior Red Cross of the Public Schools of New York
- 1927 Darrach Home for Crippled Children, in memory of Dr. May Darrach
- 1928 Mrs. Mary L. Schoonmaker, in memory of Sylvanus Lothrop Schoonmaker and Frank Layng Schoonmaker (10 Beds)
Estate of Henry D. Dickinson, in memory of Hathaway M. Dickinson
- 1930 James T. and Sarah Bancroft Leavitt, to be known as the "Mrs. James T. Leavitt Bed"
- 1934 Henry C. deRham, Frederic F. deRham and Clarisse deRham Rutherford, in memory of their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of Meredith Howland Pyne

- 1936 Miss Elizabeth Stewart Hamilton, in memory of Mrs. John Hobart Warren, to be known as the "Harriette Mott Warren Bed"
Mrs. Edward S. Harkness, to be known as "Dorcas House Bed" in dear memory of Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the "Howard and Mary Louisa Potter Bed," in memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of Mrs. Maude's father, Robert I. Brewster
Estate of Carrie Rosenshine, to be known as "The Lillie Rosenshine-Marjorie L. Kaufman Bed"
- 1956 Estate of Adolph Riesenbergs, to be known as "The Adolph and Anna R. Riesenbergs Bed"

ENDOWED ROOMS

- 1922 Glenn Ford McKinney, a ward room in the country branch, in memory of his wife, Jean Webster McKinney
- 1929 400 of his friends and associates, a room in the private pavilion, in memory of H. Le Roy von Lackum, M.D., surgeon in this hospital, 1916-1928

Institute of Ophthalmology

(Including Herman Knapp Memorial Eye Hospital)

- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer, in memory of her parents
- 1923 Miss Mary Wiley, in memory of her brother, George Wiley
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Leo Doblin
- 1936 Charles M. Brooks
- 1957 Mortimer and Harriet M. Marcus Foundation, Inc., to be known as "The Mortimer and Harriet M. Marcus Endowment Bed"

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COLUMBIA-PRESBYTERIAN MEDICAL CENTER



The Presbyterian Hospital in the City of New York

622 WEST 168TH STREET, NEW YORK 32, N. Y.



College of Physicians and Surgeons • Columbia University
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Columbia University -
Presbyterian Hospital
Medical Center, New York
Combined Annual Report

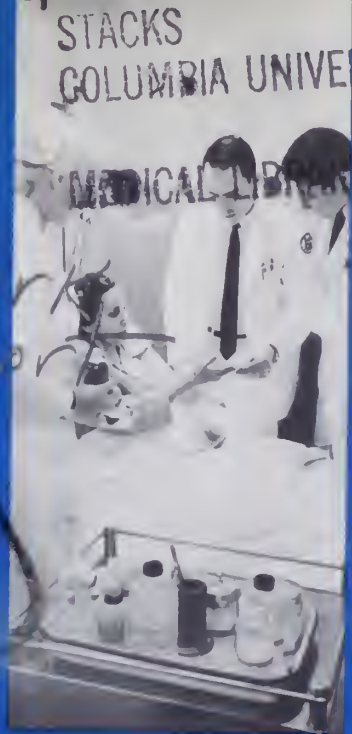
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MEDICAL

CENTER

ANNUAL
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1961





THIRD COMBINED ANNUAL REPORT
of the
COLUMBIA-PRESBYTERIAN MEDICAL CENTER

622-630 West 168th Street, New York 32, N. Y.



College of Physicians and Surgeons • Columbia University
in the City of New York

and

The Presbyterian Hospital in the City of New York

December 31, 1961

This report is dedicated to the most important person in the Medical Center, the patient; to those entrusted with his care and those who prepare to care for him.

The Medical Center comprises modern buildings and facilities for the carrying out of patient care, closely integrated with teaching and research. But it is the 7,500 people who serve and study within the Hospital and College, who give life and breath to this concept.

“Those who serve” include every worker — professional, non-professional, student and volunteer. These are the people who provide the best in patient care today and contribute toward advancement in health and medical science tomorrow.

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Origin and Functions of the Columbia-Presbyterian Medical Center

The Medical Center, comprising a group of long established hospitals of high standing and the College of Physicians and Surgeons of Columbia University, furnishes an integrated program to provide the highest quality of medical care for the sick and injured, to advance knowledge about the cause, prevention and treatment of disease and disability, and to train men and women in the professions of medicine, dentistry, nursing, public health, and allied fields. Through the affiliation between the hospitals and the University the members of the staffs of the hospitals are nominated by Columbia University, and teaching and research are conducted in all the hospitals.

College of Physicians and Surgeons

Columbia University began as King's College, which was founded in 1754 by royal grant of George II, King of England, "for the Instruction of Youth in the Learned Languages, and the Liberal Arts and Sciences." The Revolutionary War interrupted its program, but in 1784, it was reopened as Columbia College. In 1912, the title was changed to Columbia University in the City of New York.

King's College organized a medical faculty in 1767 and was the first institution in the North American Colonies to confer the degree of Doctor of Medicine in course. The first individuals to graduate in medicine from the College were Robert Tucker and Samuel Kissam, who received the degree of Bachelor of Medicine in May, 1769, and that of Doctor of Medicine in May, 1770, and May, 1771, respectively. Instruction in medicine was given until the War of the Revolution. In 1784, instruction was resumed in the academic department. Eight years later, the medical faculty was reestablished. In 1814, the medical faculty of Columbia College was merged with the College of Physicians and Surgeons, which had obtained an independent charter in 1807. In 1860, by agreement between the Trustees of the two institutions, the College of Physicians and Surgeons became the Medical Department of Columbia College; from that time on, the diplomas of the graduates were signed by the President of Columbia College, as well as by the Presi-

dent of the College of Physicians and Surgeons. The connection was only a nominal one, however, until 1891, when the College was incorporated as an integral part of the University. Since September, 1917, women have been admitted to the School on the same basis as men. In 1928 the College of Physicians and Surgeons moved from its site on West Fifty-Ninth Street to the Medical Center at 168th Street between Broadway and Fort Washington Avenue. As a part of the Columbia-Presbyterian Medical Center, it is housed in a seventeen story, fire-resisting, steel, brick and concrete building, each floor connecting with the wards and services of Presbyterian Hospital.

The School of Public Health and Administrative Medicine is an integral part of the medical faculty of Columbia University. The staff provides both graduate and undergraduate instruction and research opportunities in preventive and administrative medicine and in community organization for health services of all types.

The Presbyterian Hospital in the City of New York

The Presbyterian Hospital in the City of New York is the corporate title for all the voluntary hospitals and clinics at The Columbia-Presbyterian Medical Center. Some 138,000 patients a year are cared for in the hospitals, clinics, and doctors' offices of the Medical Center. The group consists of the following units:

The Presbyterian Hospital, founded as a general hospital in 1868 by James Lenox, was originally located on the block bounded by Madison and Park Avenues between 70th and 71st Streets. On April 25, 1911, Presbyterian Hospital made its original arrangement with Columbia University's College of Physicians and Surgeons for coordinating the care of the sick with the educational and research program of the University. Now Presbyterian Hospital is the largest single unit of the Medical Center. The Hospital occupies a 22-story building in which are the wards of the Medical and Surgical Services, Obstetrical and Gynecological Service, Urological Service, Ear, Nose and Throat Service, Dermatological Service and the Orthopedic Surgery Service.

Babies Hospital

Babies Hospital, 167th Street and Broadway, founded in 1887, provides for general medical and surgical care of infants and children up to their thirteenth birthday, and care for premature babies. The total capacity of the Hospital is 201. One floor is devoted to the care of private and semi-private patients. Both outdoor and indoor playrooms are provided for convalescent children. Laboratories are operated for the diagnostic and research work of the Hospital in pathology, microbiology and chemistry. An X-ray and fluoroscopic department is operated under the direction of the Hospital radiologist. An outpatient department is maintained in Vanderbilt Clinic by the attending and house staff of the Hospital. In addition to the general medical and surgical clinics, there are special clinics for children suffering from heart disease, tuberculosis, epilepsy, asthma and other diseases.

Harkness Pavilion

Harkness Pavilion, 180 Fort Washington Avenue, erected when the Medical Center was established in 1928, is available for the accommodation of 300 adult private patients of the attending staff.

The Mary Harkness Unit

Mary Harkness Unit, King Street, Port Chester, N. Y., opened in 1937 to provide convalescent care for adults. In a beautiful country setting, facilities are available for the convalescent care of 33 adults.

The Institute of Ophthalmology

Institute of Ophthalmology, 635 West 165th Street, opened in 1933, has complete facilities for the medical and surgical treatment of adult and child patients with diseases of the eye. There are private, semi-private and ward beds, with a total capacity of 92. On January 1, 1940, the work of the Herman Knapp Memorial Eye Hospital was taken over by the Institute.

The Neurological Institute

Neurological Institute, 168th Street and Fort Washington Avenue, one of the first nongovernmental hospitals in this country for the treatment of nervous diseases, was founded in 1909. It moved from East 67th Street to the Medical Center in 1929. Its affiliation with The Presbyterian Hospital has made possible a broad basic program of teaching and research in neurology and in the treatment of diseases of the nervous system and surgical conditions of the brain and nervous system. The Institute

has a capacity of 250 beds, including 15 added in 1960 for psychiatric patients.

New York Orthopaedic Dispensary and Hospital

The New York Orthopaedic Dispensary and Hospital opened as a dispensary in 1866 largely because of the interest taken in the care of the crippled by Theodore Roosevelt, father of the President of the same name. In succeeding years, the dispensary grew into a hospital with beds for ward and private patients. In 1911, the first spinal fusion operation for Potts Disease (tuberculosis of the spine) was performed by Dr. Russell A. Hibbs. This successful operation opened an entirely new era in the treatment of this disease. The Orthopaedic Dispensary and Hospital was located in its own buildings at 420 East 59th Street until December, 1950, when it moved to the Medical Center. On the 5th floor of the main building, 622 West 168th Street, facilities are available for the care and treatment of orthopedic conditions and fractures in children and adults.

The School of Nursing

The School of Nursing was founded in 1892 for the training of nurses. Since 1935, its educational program has been under the supervision of the Department of Nursing of the Faculty of Medicine of the College of Physicians and Surgeons of Columbia University. A thirty-two-month course in nursing is conducted, and graduates receive the degree of Bachelor of Science from Columbia University.

The Sloane Hospital for Women

Sloane Hospital for Women was built at West 59th Street and Amsterdam Avenue and presented to Columbia University by Mr. and Mrs. William D. Sloane in 1886. It now occupies three floors of the Presbyterian Hospital building for ward and semi-private patients and one floor in Harkness Pavilion for private patients. There are 181 beds, of which 116 are ward beds.

The J. Bentley Squier Urological Clinic

The J. Bentley Squier Urological Clinic occupies the 10th floor of the Presbyterian Hospital building and the 10th floor of Babies Hospital. There are 67 beds for the care of adults and 20 beds for children. There are laboratories fully equipped to do diagnostic, X-ray, bacteriological, pathological, fluoroscopic, and research work. This unit has two large, especially equipped, operating rooms. The urological outpatient department is in Vanderbilt Clinic.

Vanderbilt Clinic

Vanderbilt Clinic, Broadway and 167th Street, presented to Columbia University by the Vanderbilt family in 1888, is the common outpatient department and admitting service for all the wards of all the units of The Presbyterian Hospital. It is a fully equipped dispensary offering complete medical, surgical and specialty services. Eligibility to the Clinic is determined by the admitting physician and the clinic interviewer and is limited to those unable to afford a private physician. The Group Practice Clinic, organized in 1946, has proved a forward step in the diagnosis and treatment of patients.

Other Patient Care Institutions Located at the Medical Center

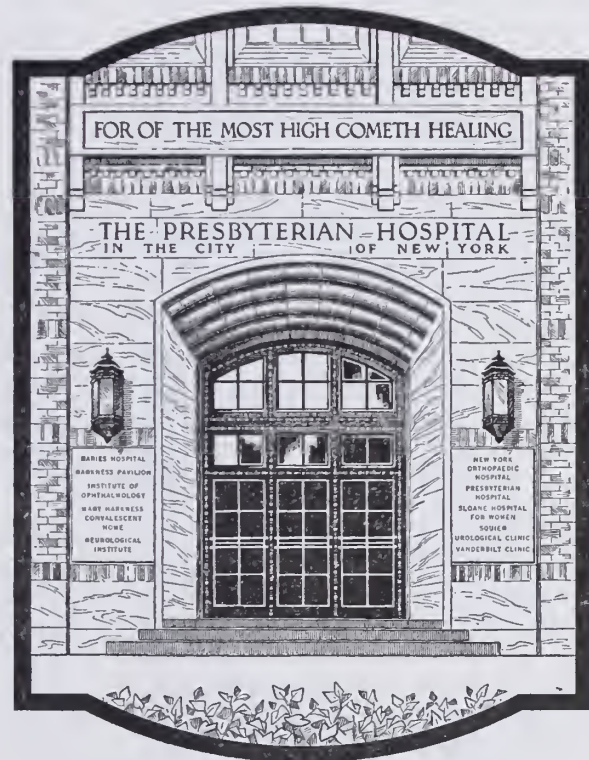
The New York State Psychiatric Institute and Hospital, built and maintained by the State of New York, is a 174 bed hospital with provisions for the study and treatment of all types of psychiatric disorders.

The Francis Delafield Hospital, built and maintained by the City of New York, is a 295 bed hospital for the treatment and study of cancer.

The Washington Heights Health and Teaching Center was built and is maintained by the City of New York.

Report of the President

The Presbyterian Hospital in the City of New York





Report of the President of Presbyterian Hospital for 1961

The immediate and most important concern of The Presbyterian Hospital is — and always will be — to excel in patient care, research and medical education. It is often said that excellence in these three areas is indivisible. Each contributes to the welfare of the patient and to the advancement of scientific knowledge which will benefit mankind.

This review of the hospital's record for 1961 will report on the highlights of what was achieved and what is planned in advancing this institution's three-fold objective. It is of interest to note at the outset that during 1961 the hospital provided 466,300 days of care for more than 39,000 patients from all parts of the world. In addition, there were 396,500 visits to Vanderbilt Clinic, of which 101,700 were free or only partly paid for, and 195,700 visits to our doctors' private offices.

In terms of expanding facilities for patient care, research and medical education, the year has been one of noteworthy achievements. New diagnostic and treatment facilities were provided for neurological radiology, pediatric ophthalmology, physical medicine and rehabilitation and radiology. In addition to these, which are among the most modern and complete such facilities in any general hospital, intensive care units were established to provide the optimum in nursing care at the lowest possible cost for the hospital's most critically ill patients.

These improvements enhance the quality of services we are able to provide for the care of our patients as well as for the education of tomorrow's physicians and the pursuit of promising research. Many vital research projects and developments in medical education are described in detail in the report of the Dean and those of the Department Chairmen.

These achievements, likewise, constitute a fitting prelude to the advances on the horizon for 1962. The first phase of the Medical Center's \$50,000,000 development program — construction of an eight story Central Service Building — is nearing completion and the structure will be ready for occupancy in the fall of 1962. This calls to mind the cover of the 1960 Annual Report, which showed an architect's rendering of 168th Street as it will appear after

construction of new buildings under the development program. By the time the current Annual Report is in print, those drawing board plans will have moved closer to realization with construction of the eighteen-story William Black Medical Research Building under way.

This progress under the Columbia-Presbyterian Medical Center Development Program is due in no small measure to the leadership of Development Committee Chairman, General Lucius D. Clay and co-chairman, Mr. Fredrick M. Eaton, both officers of the hospital's Board of Trustees. Mr. Eaton graciously accepted the co-chairmanship and took over active direction of the \$50,000,000 campaign when General Clay was appointed by President John F. Kennedy as his personal representative in West Berlin.

On October 23, 1961, a dinner marking the 50th anniversary of the affiliation between Presbyterian Hospital and the College of Physicians and Surgeons and the halfway point in the fund drive was held at The Waldorf Astoria Hotel. Former President Dwight D. Eisenhower, who was the principal speaker, paid eloquent tribute to the record of the Medical Center, and to the outstanding example it has set of both effectiveness and value to society of such privately supported institutions.

It was gratifying to be able to announce at the halfway point of the fund drive that we had achieved half of our goal, \$25,000,000. Our gratitude to General Clay, Mr. Eaton and all the dedicated persons connected with the Medical Center campaign is profound.

Presbyterian Hospital is grateful to those who have contributed to the Medical Center Campaign as well as to the thousands of friends who continue to lend generous financial support to the hospital. Since approximately half of our patients can pay nothing or only a part of the cost of their care, we depend upon this generosity to assist the hospital in maintaining its broad scope of services and high standards of care.

Our total operating expenses during 1961, including \$15,975,000 for wages, amounted to \$27,065,000. Hospital income from those served and other sources

was \$23,936,000. This left an operating deficit of \$3,129,000, which was met by income from endowment and by gifts. This again elicits our appreciation for the generosity of friends of the hospital.

Presbyterian Hospital's past accomplishments and aspirations for the future are contingent upon many factors. Perhaps the most important of these which governs the quality of services available to our patients, as well as the total efficient operation of the hospital, is far-sighted planning.

The services we offer to restore health to our patients are the yardsticks by which we measure our success. We have maintained a reputation of excellence in patient care and facilities for care because of the dedication of the hospital's outstanding professional staff combined with diligent, progressive efforts of committees under the aegis of the Medical Board, Administration and Board of Trustees. While these constitute the mainspring of our excellence, the hospital has long recognized the importance of a devoted and competent non-professional staff. It was with great satisfaction that on January 1 and October 1 of 1961 the Board of Trustees was able to provide well received and well deserved increases in wage scales — increases which total \$1,500,000 annually.

As I review the record for 1961, I am happy to join all those associated with Presbyterian Hospital in feeling pride for the recognition received by many members of our professional staff, who have been honored during the year by professional societies both in this country and abroad. It is also gratifying to have the opportunity to commend our nursing staff. The nursing school has the largest enrollment in its history and its graduates continue to enhance the hospital's full nursing complement as well as the nursing profession throughout the nation.

During the past year, Dr. George H. Humphreys, II, Director of the Surgery Service and Valentine Mott Professor and Chairman of the Department of Surgery in the medical school, completed three years of valuable and selfless service as President of the Medical Board. Dr. Humphreys has been succeeded by Dr. Lawrence C. Kolb, Director of the hospital's Psychiatry Service, Director of New York State Psy-

chiatric Institute and Professor and Chairman of the medical school's Department of Psychiatry.

As President of the Board of Trustees, I appreciate the experienced counsel of my predecessor, Mr. Cleo F. Craig, who has served as a trustee since 1951 and as President from 1958 until April 1961 when he became President Emeritus. At that same time, Mr. James C. Mackenzie was elected an honorary trustee after long and effective service on the board. It is with profound regret that I record the deaths of four members of the board. Mr. John I. Downey, who had so ably served from 1933 until 1961 and from 1922 to 1933 was a trustee of Babies Hospital, died in April, 1961. Mr. Edgar A. Newberry, a trustee since 1947, and Mrs. Henry P. Davison, a lifelong friend of the hospital and member of its board since 1938 died in January of this year. Mr. W. Alton Jones, who had served on the board since 1953, was killed in the tragic crash of an airliner in Jamaica Bay on March 1 of this year.

Four new trustees have been elected since publication of last year's Annual Report, three during 1961 and one this year. They are, Mr. Charles G. Mortimer, Chairman of General Foods Corp.; Mr. Robert B. Anderson, former Secretary of the Treasury; and Mrs. B. Rionda Braga, a Member of the Corporation for seven years, who is chairman of the Women's Auxiliary Committee for the Center's \$50,000,000 campaign. Mr. Albert C. Simmonds, Jr., Chairman of the Board and Chief Executive Officer of The Bank of New York, was elected to the Board in February, 1962.

In closing my first year's report as President, let me say that everywhere in the hospital I have been conscious of an abiding sense of dedication. This has encompassed the professional and administrative staffs, hospital personnel, members of the Auxiliaries and the volunteers who gave 109,882 hours of their unselfish service to the hospital last year. This same dedication has been manifest among members of the Board of Trustees, whose guidance and fruitful work have been of great value in the progressive conduct of our affairs.

AUGUSTUS C. LONG
President

March 1, 1962

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

Report of the President of the Medical Board

The Presbyterian Hospital in the City of New York

During 1961, erection of the eight-story skeleton of the rising central service building at the corner of Broadway and 165th Street heralded the beginning of expansion under the Columbia-Presbyterian Medical Center Development Program. This is the first visual evidence of the physical growth which will enhance facilities for health at the Medical Center. It is a source of pride and satisfaction to the many who, in recent years, have lent their energies and support to the development program.

Staff Changes

The Medical Board has lost through retirement this year three members who made outstanding contributions to the Presbyterian Hospital for many years. Miss Eleanor Lee, Director of Nursing since 1956, Dr. Rudolph N. Schullinger, Consultant in Surgery, and Dr. Lawrence W. Sloan, Consultant in Surgery, retired during 1961. Drs. Schullinger and Sloan were elected honorary members of the Medical Board. A fuller account of the long and distinguished service at the Medical Center of Miss Lee, Dr. Schullinger and Dr. Sloan is provided in the reports of the Dean and various departments.

Members of the Medical Board were saddened by the death during the year of Dr. Joseph C. Turner and Dr. John D. Kernan. Dr. Turner had served as a member of the diagnostic laboratory and joint radioisotopes committee and Dr. Kernan had been a long-time honorary member of the board.

Appointed to the Medical Board during 1961 were Dr. Carl R. Wise, Assistant Vice President in charge of Professional Services to Patients of Presbyterian Hospital; Miss Elizabeth S. Gill, R.N., named Director of Nursing on July 1, 1961; Dr. Frederick R. Bailey, succeeding Dr. Turner; Dr. Robert H. Wylic, succeeding Dr. Sloan; Dr. David V. Habif, succeeding Dr. Schullinger and Dr. George A. Perera, succeeding Dr. Charles A. Ragan, Jr., who has assumed new duties at Bellevue Hospital.

Structural Changes

Although the service building overshadows other building developments that have gone on during the

year, the completion of the renovation of the 8th and 9th floors, and the x-ray Department at Neurological Institute is an outstanding accomplishment. Besides providing adequate facilities for the many specialized diagnostic procedures needed in Neurological cases, the x-ray area also contains the Center's first Cobalt Therapy machine which is already working near capacity. The 8th floor is fully equipped for the new Rehabilitation Service and the 9th floor for neurological surgery, beside regular ward and semi-private beds, has 16 beds for intensive care of adult and pediatric cases.

Committee Activities

The membership of the Joint Committee of the Faculty of the Medical Board to study the facilities of the Medical Center was revised to include the Director of Surgery and the Director of Pathology. Dr. Wise was appointed Chairman of the Advisory Committee on Public Relations and of the Diagnostic Laboratory Committee. As the year ends, it has been decided to set up a Joint Advisory Committee on Public Relations to represent both the Hospital and the Medical School.

I am grateful to my colleagues on the Medical Board for the opportunity and honor to preside over their meetings. We are all appreciative of the dedicated service of Dr. George Humphreys, II, whose term as President of the board expired during 1961.

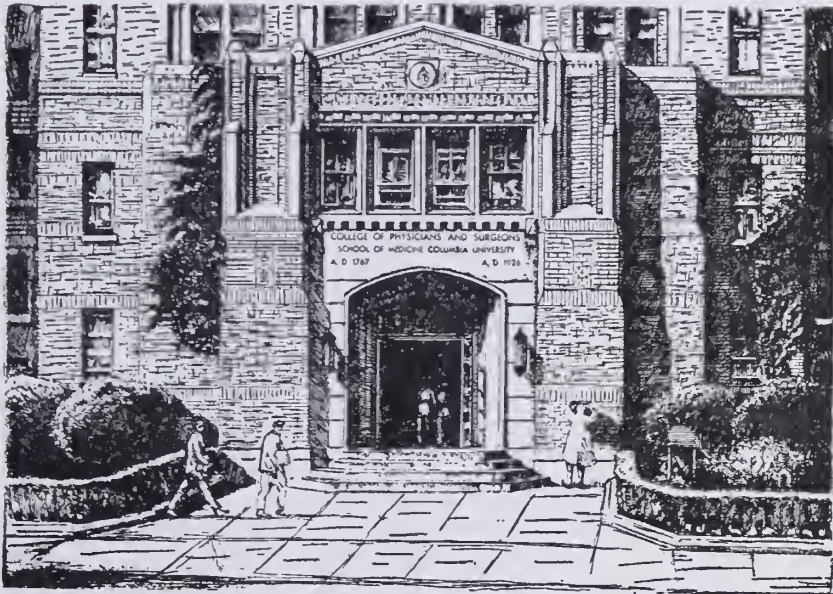
The Board looks forward to the exciting challenge of participating in the expansion of facilities at the Medical Center, during the coming years. At the same time it is cognizant of its responsibility to maintain excellent care and advance research and medical education. The Board pursues this course with confidence, inspired by the selfless interest and generous support of the Trustees and the dedication of the entire hospital staff.

LAWRENCE C. KOLB, M.D.

President of the Medical Board

Report of the Dean of the Faculty of Medicine

College of Physicians and Surgeons
Columbia University in the City of New York





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Report of the Dean of the Faculty of Medicine

The educational and research activities of the Schools of Dental and Oral Surgery, Medicine, Nursing, and Public Health and Administrative Medicine are given in the reports of the Associate Deans or Chairmen of the various departments. These reports show that the instruction of students continues at its previous high level and our research programs are constantly expanding.

The Columbia-Presbyterian Medical Center Development Program occupies a considerable portion of the time of the faculty and it is gratifying to report that the half-way point in our fifty million dollar campaign has been reached. It is also heartening that over five million of this total is designated for endowment. Ground breaking for the new research building will take place on February 5, 1962 and it is contemplated that the service building for the Hospital will be completed before the end of 1962. Construction of the research building will handicap the work of some of the departments for several months because it will be necessary to close laboratories in the portion of our present building which abuts on the new construction.

The School is especially grateful to the contributors to the Medical Center Development Program. These donations have made it possible for us to solve the greatest problem confronting us, namely the establishment of adequate quarters for our research activities and the relief of the crowding in the classrooms and laboratories for the instruction of students.

We are also grateful and extend our heartfelt thanks to the many foundations, lay health organizations, government agencies, alumni and other individuals who have contributed so generously to the educational, student research and scholarship aid programs of the School.

The registration of the School of Medicine in September, 1961 was as follows:

First Year	120
Second Year	117
Third Year	120
Fourth Year	117
	<hr/> 474

The Committee on Admission screened 1,102 qualified applicants for the study of medicine and admitted the usual class of 120. There were 108 men and twelve women in the entering class. They

came from fifty-four different liberal arts colleges, bringing a wide variety of liberal arts education to the class.

The class is widely distributed by home residence, twenty-three states and three foreign countries being represented. Eight veterans and twenty-one sons and four daughters of physicians are among the members of the class. Midyear faculty reports indicate that the class measures up to the high standards for scholarship, motivation and character set up by previous classes.

The registration of the School of Dental and Oral Surgery in September, 1961 was as follows:

First Year	37
Second Year	35
Third Year	34
Fourth Year	38
	<hr/> 144

There were twenty students registered for non-credit postgraduate courses in the Dental School and thirty-seven students registered for post-graduate credit courses. A class of fourteen students was enrolled in September, 1961 for the Courses for Dental Hygienists. Twelve received the Bachelor of Science degree in 1961.

In the School of Public Health and Administrative Medicine the registration in September, 1961 was as follows:

D.P.H. candidates	4
M.P.H. candidates	39
M.S. candidates	76
Special students	23

In September, 1961, the registration in the Department of Nursing was as follows:

First Year	163
Second Year	131
Third Year	105
	<hr/> 399

In the Course for Occupational Therapists, thirty-one students were registered in September, 1961. In the Course for Physical Therapists, thirty-eight students were registered.

The following degrees were awarded:

M.D.	117
Med.Sc.D.	1
D.D.S.	38

D.P.H.	3
M.P.H.	28
M.S. (Nursing and Public Health fields)	60
B.S. (Nursing, Occupational Therapy, Physical Therapy, Dental Hygiene)	139

In addition to the students enrolled under the Faculty of Medicine, there were approximately seventy-nine students registered under the Graduate Faculties of the University who took courses and advanced research work in the departments of the Medical School.

The preceding figures indicate that the Faculty of Medicine is responsible for the instruction of many more students, graduate and undergraduate, than is commonly known. The total of medical, graduate, postgraduate, nursing, occupational therapy, physical therapy, dental, dental hygiene, and public health students, visiting scholars, fellows, hospital residents and younger staff members runs to over three thousand full-time and part-time students.

It is gratifying to report that during the academic year 1961, 194 medical students received scholarships averaging \$600. Of these, 60 were summer research scholarships.

It is with the greatest sorrow that we report the following deaths:

- Adolph Berger, Consultant, Dental Service, Presbyterian Hospital, on April 14, 1961
- Monroe Birns, Instructor in Pathology, on May 20, 1961
- Gioacchino Failla, Professor Emeritus of Radiology (Physics), on December 15, 1961
- Samuel Frant, Lecturer in Public Health and Administrative Medicine, on July 30, 1961
- James W. Jobling, Delafield Professor Emeritus of Pathology, on November 9, 1961
- Norman H. Jolliffe, Lecturer in Public Health and Administrative Medicine, on August 1, 1961
- John D. Kernan, Professor Emeritus of Otolaryngology and Consultant, Presbyterian Hospital, on July 21, 1961
- Blaise A. Pasquarelli, Associate in Psychiatry and Assistant Attending Psychiatrist, Presbyterian Hospital, on September 3, 1961
- Joseph C. Turner, Professor of Medicine and Attending Physician, Presbyterian Hospital, on February 28, 1961

The following retirements, effective June 30, 1961, are reported:

- George E. Daniels, Clinical Professor of Psychiatry and Attending Psychiatrist, Presbyterian Hospital
- Morris Dinnerstein, Clinical Professor of Medicine, (Bellevue Hospital)
- Eleanor Lee, Professor of Nursing, Associate Dean (Nursing), and Chairman of Department of Nursing and Director of Nursing, Presbyterian Hospital
- Richmond L. Moore, Associate Professor of Clinical Surgery and Attending Surgeon, Presbyterian Hospital

Dickinson W. Richards, Jr., Lambert Professor of Medicine, (Bellevue), Director of First Medical Division, Bellevue Hospital and Attending Physician, Presbyterian Hospital

Rudolph N. Schullinger, Professor of Clinical Surgery and Attending Surgeon, Presbyterian Hospital

Sidney P. Schwartz, Associate Clinical Professor of Medicine (Montefiore)

Lawrence W. Sloan, Professor of Clinical Surgery and Attending Surgeon

DeGraaf Woodman, Clinical Professor of Otolaryngology and Attending Otolaryngologist, Presbyterian Hospital

The following emeritus designations were made by the Trustees, effective July 1, 1961:

Eleanor Lee, Professor Emeritus of Nursing

Dickinson W. Richards, Jr., Lambert Professor Emeritus of Medicine

Rudolph N. Schullinger, Professor Emeritus of Clinical Surgery

Lawrence W. Sloan, Professor Emeritus of Clinical Surgery

The following designations were made, effective July 1, 1961 unless otherwise indicated:

George Goldman, Associate Clinical Professor of Psychiatry to be Director of Psychoanalytic Clinic

David V. Habif, Acting Chairman of Department of Surgery and Acting Director of Surgical Service, from October 1, 1961 to March 31, 1962

Charles A. Ragan, Lambert Professor of Medicine and Director of First Medical Division, Bellevue Hospital

Walter S. Root, Acting Chairman of Department of Physiology

W. Henry Sebrell, Robert R. Williams Professor of Nutrition

David Shemin, Acting Chairman of Department of Biochemistry from January 1, 1961 to June 30, 1961

The following promotions were made, effective July 1, 1961, unless otherwise indicated:

C. Andrew L. Bassett, Associate Professor of Orthopedic Surgery

Michael V. L. Bennett, Associate Professor of Neurology

Viola W. Bernard, Clinical Professor of Psychiatry, from October 1, 1961

William A. Blanc, Associate Professor of Pathology

William A. Briscoe, Associate Professor of Medicine

Frederick S. Craig, Associate Professor of Clinical Orthopedic Surgery

Herbert O. Elftman, Professor of Anatomy

Ernest M. Gruenberg, Professor of Psychiatry (Epidemiology) from October 1, 1961

Elizabeth S. Gill, Professor of Nursing, Associate Dean (Nursing), Chairman of Department of Nursing and Director of Nursing, Presbyterian Hospital

Melvin M. Grumbach, Associate Professor of Pediatrics

Scymour P. Halbert, Professor of Ophthalmology

Edgar C. Hanks, Associate Professor of Clinical Anesthesiology

Clifford V. Harding, Associate Professor of Physiology

Robert B. Hiatt, Associate Professor of Surgery

Frederick G. Hofmann, Associate Professor of Pharmacology

Albert R. Lamb, Jr., Associate Professor of Clinical Medicine

John H. Laragh, Associate Professor of Clinical Medicine

Paul A. Marks, Associate Professor of Medicine

Herman Schwartz, Associate Professor of Clinical Anesthesiology from January 1, 1961

Morton D. Schweitzer, Associate Professor of Epidemiology

William A. Silverman, Associate Professor of Pediatrics

Frank W. Van Dyke, Associate Professor of Administrative Medicine

Gilbert J. Vosburgh, Associate Professor of Clinical Obstetrics and Gynecology (Change of Title)

The following new appointments were made:

Jacob Furth, Professor of Pathology, from September 1, 1961

Elmer E. Stickley, Associate Professor of Radiology (Physics), from October 1, 1961

Robert W. Winters, Associate Professor of Pediatrics, from July 1, 1961

The Janeway Prize, awarded to the graduate who, in the opinion of the Faculty, has ranked highest in efficiency and ability, was given to Stanley Luftschien, Class of 1961. The Borden Undergraduate Research Award was given to Stanley Cohen for outstanding research work during the medical course.

The Department of Psychiatry Prize for best work in Psychopathology by a second year student was awarded to Clifton M. Howard. The Roche Award was given to Robert H. Heissenbuttel, who also received the Frederick P. Gay Memorial Award. The Joseph Mather Smith Prize, awarded to the graduate whose essay or original research in medical subjects is deemed by the Committee on Awards to be the most meritorious, was given to Dr. Nicholas P. Christy, Class of 1951. The William Perry Watson Prize in Pediatrics was given to Leonard D. Kohn. The Harold Lee Meierhof Memorial Prize in Pathology was given to Philip R. Larsen. Julian C. Zener received the American Psychiatric Association Award. Robert M. Neer, Jr., Walter E. Morgan III and John L. Robinson received the Merck Manual Award of Merit.

The Graduate and Postgraduate Program

The graduate and postgraduate training program continued at an all time high with 251 interns and

residents, and 257 trainees and fellows. There were 49 visiting fellows from institutions throughout the continental United States, as well as from many foreign countries. In addition, the staff has contributed to the training of physicians at hospitals affiliated with the Medical School. They have also cooperated with the Department of Hospitals of New York in helping to develop an educational program for Harlem Hospital.

Seventy-five courses were offered in the postgraduate program during the past academic year in which 1,310 physicians were registered. This is an increase in attendance of some 452 over last year, which is accounted for by newly introduced courses here at Medical Center which were fully enrolled, as well as a general increase in enrollment in other courses. The postgraduate program is being constantly reviewed by the Committee on Graduate Clinical Instruction so that courses can be offered in the fields in which the most need exists.

	<i>Number of Courses</i>	<i>Number of Students</i>
Columbia-Presbyterian Medical Center	21	1001
Hospital for Joint Diseases	3	20
Montefiore Hospital	14	78
Mount Sinai Hospital	36	211
Bellevue Hospital	1	—
	<hr/> 75	<hr/> 1310

The Medical School cooperated with the Federal Aviation Agency in presenting a three day medical seminar for aviation medical examiners. This was part of a nation-wide program to help establish criteria for civilian flying personnel. In addition, participation in the federally sponsored program of Medical Education for National Defense was continued.

During the past year, six new candidates have registered for the Doctor of Medical Science degree and are working in the various basic science departments. In addition, two previously registered candidates have completed the requirements and will be presenting their theses for review in the coming year.

Student Health Service

The Student Health Service has remained under the direction of Dr. Albert R. Lamb, Jr.

During the past academic year 1960-61 there were 391 routine physical examinations performed on the students. In addition, routine chest x-rays were obtained on the student body. Besides providing these

regular health services, the Student Health Service has continued to help the students in a number of other ways, such as completing insurance forms, rendering premarital examinations, giving immunizations for foreign travel, and offering advice and counsel on a wide range of subjects.

The Personnel Health Service, with Dr. Joseph J. Barlow in charge, has performed 264 pre-employ-

ment physical examinations. In addition, there have been 782 office visits for medical care. On July 1, 1961, Dr. Philip W. Brickner succeeded Dr. Barlow as Physician-in-Charge of this service.

H. HOUSTON MERRITT, M.D.

Dean of the Faculty of Medicine

December 30, 1961

Reports of Departments
and Services



Anatomy

WILFRED M. COPENHAVER

*Professor and Chairman
of the Department*

The Department of Anatomy has been strengthened by new appointments as follows: Dr. Philip W. Brandt, Assistant Professor, Dr. Stanley M. Crain, Assistant Professor (Neurology), and Dr. Nancy L. Trotter, Instructor. Dr. Brandt's appointment to a full-time position adds to our teaching potential and to research in electron microscopy. Dr. Crain will devote most of his time to a study of electrophysiological activity in neurons grown in tissue culture.

During the year there were nine graduate students in residence for the Ph.D. degree and there were seven postdoctoral fellows in training. The predoctoral and postdoctoral programs have been financed largely from outside support. A United States Public Health Service training grant, which became effective on March 1, 1961, will provide support by 1962 for eight predoctoral as well as three postdoctoral students. Another United States Public Health Service training grant, which is under the direction of Professor Malcolm B. Carpenter, provides support for three postdoctoral students. These students wish to specialize particularly in neuro-anatomical research.

Research Activities

Professor Frederic J. Agate, Jr. is continuing studies on the endocrine properties of steroid protein conjugates in collaboration with Drs. Sam M. Beiser and Bernard F. Erlanger, both Associate Professors of Microbiology, and Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology). Professor Agate is also collaborating with Dr. William A. Silverman, Associate Professor of Pediatrics and Associate Attending Pediatrician, on studies of temperature control in premature infants. Based on the results of their studies, Professors Agate and Silverman have designed an idealized incubator. In collaboration with Dr. Lewis J. Doshay, Associate in Neurology and Associate Attending Neurologist, Professor Agate is continuing studies on the quantitative measurement of tremor and rigidity in Parkinson's disease.

Professor Edmund Applebaum is studying the histology of teeth under different experimental conditions in collaboration with Dr. Edward V. Zegarelli, Professor of Dentistry and Attending Dental Surgeon, Dr. Austin H. Kutscher, Assistant Profes-

sor of Dentistry, and Dr. Carolyn R. Denning, Associate in Pediatrics and Assistant Attending Pediatrician. The studies include the effects of prolonged administration of a group of experimental steroids, antibacterial agents, and other drugs.

Professor Brandt has been utilizing the methods of electron microscopy and fluorescence microscopy in studies on pinocytosis and fluid transport.

Professor Carpenter has conducted neuroanatomical studies on the neural mechanisms of cerebellar dyskinesia in the monkey, and the anatomical organization and physiological functions of the vestibular system. Some of the studies in the latter field have been concerned with the relationships between the vestibular nuclei and the cerebellum, while others have been attempts to determine by silver staining methods the fiber projections of particular nuclei of the vestibular complex. The most recent phase of the investigation has concerned the neural mechanisms which play essential roles in conjugate eye movements.

Professor Herbert Elftman has continued his studies on the histochemistry of the endocrine glands and their target organs. The effect of estrogen on phospholipids, glycogen, alkaline phosphatase and the Golgi apparatus of the castrate rat uterus has been utilized as a delicate test for estrogen by observing the results of injecting minute quantities of solutions and of tissue homogenates directly into the uterus. This has provided information concerning the sources of estrogen during normal reproduction and the time factors for distribution and utilization. The effect of other steroids on the uterus has also been studied, the difference between the results obtained by direct application and by subcutaneous injection serving as an index of the extent to which metabolism of these hormones in the body modifies their activity. Professor Elftman has continued to serve as a member of the committee on Prosthetics Research and Development of the National Research Council.

Professor Charles A. Ely has extended his study of antisera to crude pituitary extracts to those directed against relatively pure pituitary extract now made available by the National Institute of Health. He is being assisted in this project by Dr. Thomas Tallberg from Helsinki. Professor Ely is also continuing his studies on the effect of irradiation on the mouse ovary and their modification by various hormone and antihormone preparations.

Dr. I. Lester Firschein is engaged in genetic studies on the incidence of multiple births in New York City, on tapeto-retinal degeneration (Retinitis pigmentosa) and deafness (Usher's Syndrome), and

the cytogenetic classes of Mongolism from a population point of view.

Professor Emanuel B. Kaplan is completing a book on "Surgical Approaches to the Extremities and Spine" and is working on a second edition of his book on "Functional and Surgical Anatomy of the Hand."

Professor Melvin L. Moss is continuing comparative studies of skeletal metabolism, and malformations of the head and neck. Work in the first category included field investigations of marine fishes at the Lerner Marine Laboratory, Bimini, Bahamas, and at the Arctic Research Laboratory, Barrow, Alaska. Professor Moss is also collaborating with the Department of Vertebrate Paleontology, American Museum of Natural History, on studies on the phylogeny of skeletal tissues. Additional inter-institutional studies were carried out with the National Bureau of Standards, the Bingham Oceanographic Laboratory of Yale University, and the Marine Laboratory of the University of Miami. During the year, Professor Moss played an active part in the founding of the International Society for Cranio-Facial Biology and he was elected editor of its new journal.

Research in Professor Margaret R. Murray's tissue culture laboratory consists of a long-term project in the area of cancer etiology and a number of other investigations centered around the normal production of the myelin sheath and its disintegration in various disease conditions. Work by Mrs. Edith Peterson on the effects of diphtherial toxin upon myelinated cultures of dorsal root ganglia has shown a pattern of myelin degeneration that follows closely the course of diphtherial polyneuritis *in vivo*. Mrs. Peterson has also demonstrated the reality of the Schmidt-Lantermann clefts in normal myelinated nerve fibers by photographing them in the same fiber, both living and fixed.

Professor Charles R. Noback continued his work on regeneration in the central nervous system. He found that the outgrowth of perivascular mesenchymal cells of the spinal cord have a significant role in regeneration across the gap of the transected cord of the adult cat. Professor Noback also studied the brains of a selected series of primates and insectivores to determine phylogenetic trends and adaptive specializations of the brain stem nuclei. The post-natal ontogeny of the neocortical neurons of the cat have been studied in a series of Golgi preparations and the results have been correlated with otogenetic neurophysiological data.

Professor George D. Pappas has investigated a number of cytological problems by electron micros-

copy. Further studies on the fine structure of helicies found in the nucleus of *Amoeba proteus* indicate that these organelles represent the second order coils of DNA molecules. In collaboration with Professor Brandt, Professor Pappas is continuing studies on pinocytosis in ameba. In collaboration with Dr. Gordon I. Kaye, he has studied the fine structure of the cornea in relation to fluid transport. Studies on the choroid plexus and ependyma in relation to spinal fluid dynamics are being done in collaboration with Dr. Virginia M. Tennyson. In collaboration with Dr. Mary B. Bunge, Professor Pappas has studied myelin degeneration and regeneration produced experimentally in cats with interesting results on myelin formation in the central nervous system.

Professor William M. Rogers has been obtaining excellent results in his program aimed at establishing phonocardiographic criteria useful in the diagnosis of congenital and acquired cardiovascular lesions. Co-investigators include Dr. James S. Harrison, Dr. James R. Malm, Assistant Professor of Surgery and Assistant Attending Surgeon, Dr. Gregory A. Jameison, Assistant Professor of Pediatrics, Assistant Attending Radiologist and Director of the Cardiovascular Laboratory, and Dr. Yousif Al-Naaman, Research Associate in Surgery. Dr. George H. Humphreys, II, Valentine Mott Professor of Surgery and Director of the Surgical Service, has sponsored and collaborated in the program.

Professor Shih-Chang Shen is continuing his program of study on synaptic differentiation. The problem is being studied both by cytochemical methods and by electron microscopy.

Professor George K. Smelser is investigating the metabolism of corneal sulfated mucopolysacchrides, exophthalmos, uveal mast cells, and the fate of grafted corneal tissue. He has found that adult corneal sulfated mucopolysacchrides are made and destroyed at such a rate that fifty per cent of this material is replaced every thirty days. Studies on exophthalmos indicate that an increase in connective tissue mucopolysacchrides is responsible for the orbital edema.

Dr. Trotter is studying the fine structure of the cytoplasm of early and late transplant generation hepatoma cells and of regenerating liver cells at various hours after partial hepatectomy in mice.

Professor Copenhaver is continuing his studies on cytodifferentiation of cardiovascular tissue. Studies of autoradiographs of fetal and adult hearts of mice treated with tritium-labelled thymidine are being made in collaboration with Dr. Steven J. Phillips. Work is being continued on the effects of X-irradiation on cardiovascular tissue in collaboration with Dr. Roberts Rugh, Associate Professor of Radiology.

Acknowledgments

The research work of the various members of the department has been aided by grants from the American Heart Association, Dunlevy Milbank Foundation, Helen Hay Whitney Foundation, Robert Chuckrow Construction Co., Inc., Life Insurance Medical Research Fund, The National Foundation, National Science Foundation, Squibb Institute for Medical Research and several institutes of the National Institutes of Health of the United States Public Health Service.



Anesthesiology

EMANUEL M. PAPPER

Professor and Chairman of the Department · Director of Service

During 1961 the authorized strength of the attending staff in the Anesthesiology Service was increased by two and the number of residents decreased by the same number. This change was made possible by the productivity of the residency and research fellowship programs in developing academically-minded physicians of high quality who desire to spend their professional careers in a university Department of Anesthesiology. The attending staff was strengthened by the addition of the following: Dr. Donald C. Brody returned to us from military service with the Army. Dr. Mieczyslaw Finster returned to the Anesthesiology Service after a research fellowship under the direction of Dr. Frederic J. Agate, Jr., Associate Professor of Anatomy. Dr. Lynne T. Greene came to us following his resignation from the United

States Navy. Dr. Stuart J. Leavitt became a member of the attending staff on his completion of the residency in anesthesiology in the Presbyterian Hospital and Dr. Stuart A. Sullivan on his completion of a research fellowship under Dr. Andre Cournand, Westchester Heart Association Professor of Cardiovascular Research at Bellevue Hospital. Dr. Charles E. Wolf completed a research fellowship under the direction of Dr. Walter S. Root, Professor of Physiology, before returning to the staff. Dr. Richard J. Kitz was granted leave of absence to embark on a special National Institutes of Health research fellowship with Dr. Irwin B. Wilson, Associate Professor of Biochemistry. Professor Herbert Rackow was granted a leave of absence from his clinical duties to spend a sabbatical year in full time research in

the Department of Anesthesiology. Dr. Sol M. Shnider was assigned to the Anesthesiology Service of the Sloane Hospital for Women to strengthen the obstetrical anesthesiology service.

New research fellows consist of Dr. Marvin J. Roebuck from the University of Toronto who came as a Fellow of the New York Heart Association to work with Professor Gabriel G. Nahas. Dr. Shirley Markee embarked on a research fellowship under the provision of a National Institutes of Health training grant under the supervision of Dr. Shih-Chun Wang, Professor of Pharmacology. Dr. Anna Bossers, also became a National Institutes of Health research Fellow with Dr. L. Stanley James, Assistant Professor of Pediatrics (Anesthesiology) and Assistant Attending Pediatrician, and Professor Frank Moya of this department. Dr. Paul Poppers entered a year of research fellowship sponsored by the National Institutes of Health under the direction of Dr. William L. Nastuk, Professor of Physiology. Dr. Deborah Klonymus started a research fellowship with Professor Herbert Rackow. During the year, two research fellows sponsored by the French government, Dr. Jean Moreaux and Dr. René Reveillaud worked under the direction of Professor Nahas. Dr. Francine Rey from the University of Paris joined Professor Nahas' group in the autumn of 1961. The neonatal physiology group had several research fellows this year. Two of them, Drs. Gillian Gandy and Nicholas Cunningham, are primarily responsible to Professor James and two, Drs. June Morishima and Virginia Thorndike, to Professor Moya. With the support of the training grant program four college students spent a predoctoral summer program in the Department of Anesthesiology.

Professor Gabriel G. Nahas, in cooperation with Professor Holmdahl, has determined the volume of distribution of C-14 tagged 2-Amino-2-Hydroxymethyl-1, 3-Propanediol (THAM). It was found that plasma radioactivity disappeared exponentially, reaching a plateau between four to six hours, at which time C-14 had distributed in 50%-60% of body water. Equilibration of C-14 between plasma and R.B.C. started after one hour and was nearly completed after six hours. C-14 appeared in cerebrospinal fluid between thirty and sixty minutes. Assuming that THAM is not significantly degraded in the body, this study would indicate that it tends to equilibrate with the intracellular compartment within six hours.

With the cooperation of Dr. Jose Strauss, Mrs. Iris W. Schwartz and Miss Mariagnes Verosky, the effect of 2-amino-2-hydroxymethyl-1, 3-propanediol on glucosuria induced by phloridzin was studied by

Professor Nahas. The effects of Tris (hydroxymethyl) amino methane (THAM) and NaHCO_3 on the glucosuria of phloridzinized dogs was studied. A marked and lasting increase in tubular reabsorption of glucose (T_G) was observed in four of ten dogs infused with 0.3M THAM. Three dogs infused with NaHCO_3 did not show a similar effect. The reasons for this discrepancy are under investigation.

In cooperation with Dr. Reveillaud, Mrs. Schwartz and Miss Verosky, the renal effect of Tris (hydroxymethyl) amino methane (THAM) during constant CO_2 load was studied by Professor Nahas.

Renal studies were performed on ten dogs treated with an infusion of THAM during one hour of apneic oxygenation. There was a five-fold increase in diuresis with no significant change in inulin clearance. Evidence was adduced that THAM is an osmotic diuretic. Despite a rising pCO_2 the tubular reabsorption of bicarbonate remained constant during most of the experiment suggesting that THAM penetrates into the tubular cell and interferes with the $[\text{H}^+] - [\text{Na}^+]$ exchange mechanism. There was a significant net increase in $[\text{H}^+]$ excretion which paralleled the elimination of ionized THAM $[\text{R.} + \text{NH}_3]$.

In cooperation with Dr. Serge J. Dos, Dr. Arnold Mittelman, Instructor in Surgery and Assistant Surgeon, and Professor Harold G. Barker, Associate Professor of Surgery and Associate Attending Surgeon, the adreno-cortical response during corrected and uncorrected hypercapnic acidosis was studied.

Adrenal venous flow rate and cortisol synthesis were measured in dogs subjected to hypercapnic acidosis before and after intravenous administration of 0.34 mM/kg of Tris (hydroxymethyl) amino methane (THAM). Adrenal venous blood resembled arterial blood rather than peripheral blood in its pCO_2 , O_2 saturation and pH under the conditions of these experiments.

With Professor Holmdahl and Dr. Driss Hassam and Dr. William Manger, Instructor in Medicine and Assistant Physician, studies were performed on the buffering of hypercapnic acidosis by sodium carbonate. Eight dogs were given 0.15-0.18M solution of Na_2CO_3 intravenously during one hour of apneic oxygenation. Na_2CO_3 administration, while maintaining blood pH constant, did not offset the circulatory disturbances created by the acid load of apneic oxygenation.

With Professor Lester C. Mark and Dr. Marvin Roebuck, a Fellow of the New York Heart Association, an experimental study of the production and correction of cardiac arrhythmias was undertaken. This study was an extension of the one begun by

Professor Robert M. Epstein on circulatory changes following rapid correction of severe hypercapnic acidosis by 2-amino-2-hydroxymethyl-1, 3-propanediol.

In a series of twelve animals it was possible to produce cardiac standstill in the course of post-hypercapnic acidosis when a hypertonic solution of mannitol and glucose was infused into the animals. There was a marked fall in the plasma sodium and increase in potassium. When the ratio of sodium to potassium fell below ten, cardiac arrest was observed. Resumption of systole was obtained when hypertonic sodium chloride (1.5M) was injected.

With Dr. Manger and Professor David Habif, Associate Professor of Clinical Surgery and Attending Surgeon, a study of pH control on the course of irreversible shock was made. The maintenance of a normal pH during 150 minutes of hypotensive hemorrhagic shock did not significantly alter the survival rate of the animals. However, when in addition to the maintenance of a normal pH by buffering, an increased concentration of inhaled oxygen was provided, a significant increase in the survival was observed.

With Dr. James Malm, Assistant Professor of Surgery and Assistant Attending Surgeon, and Dr. Roebuck, a study was undertaken to assess the effect of correcting acidosis which develops during hypothermia.

With Professor B. Raymond Fink the effect of infusion of THAM on the respiration of the mid-brain cat has been studied. The pH at which this preparation becomes apneic was determined and is much higher than that which produces apnea in the midcollicular vagotomized animal.

Professor Cyril Sanger has studied radiation therapy in patients with malignant disease with high-pressure oxygen. Eighteen patients were treated initially before the controlled series was started. In the controlled series, seventeen patients have been treated to date: six in oxygen, five with reduced fractionation of radiation but without oxygen, and six conventionally. Improved response has been seen in tumors but it is as yet not possible to assess the results accurately.

Studies of temperature and electrocardiographic changes during and after exposure to high-pressure oxygen have been made in collaboration with Dr. Richard S. Matteo. After much technical difficulty a satisfactory tissue oxygen electrode is now working and this has been used to demonstrate experimentally produced changes in oxygen tension in patients.

Professor James has continued his studies of the

effects of asphyxia and deranged acid-base balance on the cardiovascular system of the newborn. The more asphyxiated infants, in whom the cardiac silhouette is enlarged, have evidence of abnormal intracardiac shunts including a L-R shunt through the foramen ovale and mitral and/or tricuspid regurgitation in some instances. These phenomena have been studied by means of intracardiac pressure measurements, phonocatheterization, and a newly developed pliable intracardiac hydrogen electrode. In view of these shunts it appears that the cardiac enlargement is due to dilatation, which is secondary to the biochemical changes of asphyxia.

During the last year, studies of renal function in the immediate neonatal period have been made in collaboration with Dr. José Strauss.

These studies were undertaken to ascertain whether renal function could be correlated with the varying degrees of acidosis present at birth and in the immediate neonatal period. The initial part of the study involved healthy newborn babies, all of whom achieved a relatively normal acid-base balance in the first few hours of life. Although no obvious correlation with pH was apparent in this healthy group several interesting findings were observed.

These included considerable variability from baby to baby in regard to urine flow, concentrating ability, renal plasma flow and glomerular filtration rate. Higher flows and greater powers of concentration and dilution of the urine appear to be present than have been believed possible in the past. Over a more extended study period the various renal functions appear to adopt a certain pattern. The explanation is not likely to be simple, not only because of the acute stress of labor and delivery, but also because of readjustments involving the intracellular fluid compartments, and indeed every system in the body.

Present interests are concentrating on O_2 consumption, CO_2 output and hydrogen ion excretion in the newborn. A special servo controlled apparatus has been developed which will permit minute to minute O_2 consumption and CO_2 output, together with continuous monitoring of tidal air volume and respiratory rate in unrestrained infants without the use of a face mask. Particular attention will be paid to the thermal environment.

Animal studies have dealt with induction of the respiratory distress syndrome by intrauterine asphyxiation. Electrolyte and organic acid levels are being studied. Tissue glycogen levels are being related to survival rates under hypoxic conditions.

Professor Frank Moya and his colleagues in the

Obstetrical Anesthesiology Service have engaged in the following research projects:

In order to investigate clinically the cardiovascular effects of spinal anesthesia during cesarean section the anesthetic records of 1,633 patients were studied by Professor Moya with Dr. Bradley Smith, United States Naval Research Fellow. Of a series of 1,141 patients who received ephedrine prophylactically, forty-six percent had prepartum falls in pressure exceeding twenty percent of the preanesthetic level, and in more than half of the women the pressure fell below 100 mm. Hg systolic. No correlation was found between the incidence of hypotension and the level of sensory analgesia. In a comparable group of 64 patients methoxamine was found to be more effective as a prophylactic and therapeutic agent than ephedrine. However, there was also a significantly greater incidence of hypertension with methoxamine. Evidence was presented which suggests that pressure on the vena cava by the uterus may contribute significantly to the production of hypotension below 100 mm. Hg systolic. These results have led to a detailed study of the hemodynamic changes associated with anesthesia, labor and delivery. By means of continuous intraarterial, central and femoral venous pressure recordings Professor Moya, in collaboration with Dr. Sol Shnider, is studying the effects of bearing down, changes in position of the uterus and spinal anesthesia. In addition, they have initiated a long-term double-blind study of the prophylactic use of the vasopressors ephedrine, mephentermine and methoxamine for cesarean section.

Professor Moya, Dr. Anna Bossers, National Institutes of Health Research Fellow, and Arthur Hoyte, Josiah Macy, Jr. Foundation Scholar, have been studying the fluctuation in the microhematocrit during cesarean sections and vaginal deliveries. This technique has been successfully employed in general surgery as an index of blood volume changes due to acute hemorrhage. Initial results suggest that in obstetrics this technique may not be reliable as an indicator of blood loss.

Professor Moya and his associates have continued their study of the acid-base status of mothers during labor, particularly in relation to analgesia and anesthesia. The effects of high spinal anesthesia on ventilation during cesarean section were studied in fifteen women by means of arterial blood gas determinations. It was found that spinal anesthesia did not impair the effectiveness of ventilation provided small doses of the spinal anesthetic agent were used and blood pressure maintained. The effects of controlled hyperventilation on the internal environ-

ment of the mother and baby are being investigated at present. Preliminary results indicate that the fetal blood usually shows a higher pH and lower $p\text{CO}_2$ as the mother becomes progressively more alkalotic. However, there is evidence which suggests that uterine blood vessels may react to hypocapnia and alkalosis by vasoconstriction in a manner similar to cerebral vessels, and at a certain critical level may cause tissue hypoxia. These interesting leads are being followed up with animal experiments by Drs. Hisayo Morishima, Virginia Thorndike and A. Bossers, which should clarify the effect of hyperventilation and alkalosis on the exchange of respiratory gases between the mother and fetus.

Professor Moya, in collaboration with Drs. Morishima, Thorndike and Bossers, is standardizing a placental perfusion technique in animals in order to study the transfer of radioactive isotope tagged drugs across the placenta. By using a broad spectrum of drugs with various lipid solubilities and dissociation constants, information will be sought on the kinetics of placental transfer.

Dr. Shnider is collaborating with Professor Moya in studying the effects of maternal premedication on the clinical condition of the newborn infant. It was found that babies born of mothers who received meperidine two to three hours before birth were more depressed than those who received the medication within the first hour or between three to four hours of birth. A higher percentage of low score babies was found when combinations of meperidine and seconal or meperidine and phenothiazine were used.

Professor Vance Lauderdale has been studying a means of increasing the accuracy and usefulness of the department's record-keeping system.

Professor B. Raymond Fink has continued a study of respiratory regulation during halothane anesthesia in collaboration with Professors Shih-hsun Ngai and Edgar C. Hanks. The respiratory threshold was found to rise as anesthesia deepened. The rise is probably a quantitative index of anesthetic depression. It appears to be related to depression of the reticular function, which is probably an integral component of the central respiratory regulating mechanism. A similar study in patients anesthetized with ether is proceeding.

Professor Fink and Professor Charles C. Wycoff are studying the effect of posture on ventilation during neurosurgical operations. Early results suggest that ventilation in the prone position is seldom depressed during halothane anesthesia.

The contribution of the rostral midbrain to respiratory regulation in the cat was studied in col-

laboration with Dr. Ronald Katz and Dr. Arnold Schoolman, Assistant Resident in Neurological Surgery. This area was shown to contain elements increasing the respiratory response to carbon dioxide and delaying the development of apnea with over-ventilation.

Professor Fink has shown with the aid of x-ray, cinematographic and anatomical studies that several specializations peculiar to man are adapted to efficiency of phonation at minimum energy cost.

In collaboration with Dr. Schoolman, a method was developed for measuring the arterial pH and PCO_2 in the intact unanesthetized cat. The results establish standards of normal values previously not available in this animal.

Professor Herman Schwartz continued his studies of the cause of the rise in intraocular pressure following the injection of intravenous succinylcholine during light general anesthesia. No satisfactory explanation has been found as yet. Professor Schwartz studied sixteen children during muscle operations to determine if a method can be devised to avoid trigemino-vagal bradycardia. Increasing the dose of belladonna drug used for premedication affords better protection than retrobulbar block.

Professor Schwartz reviewed the anesthetic records of 181 patients who had two percent and three percent atropine ophthalmic drops administered at the end of operation for mydriasis. Atropine in this form is rapidly absorbed into the systemic circulation. Accordingly, the dose has been halved to avoid the problems of excessive effect of atropine.

Professors Herbert Rackow, Ernest Salanitro and Robert M. Epstein have extended their studies on the kinetics of pulmonary anesthetic gas exchange to infants as young as six months of age. The uptake and excretion curves of ten percent nitrous oxide in these young infants (anesthetized with fluothane) show a more rapid arrival at equilibrium with the inspired gas mixture than is the case with older children and adults. The reasons for this difference are not entirely clear but may be partly related to differences in cardiac output and/or lung ventilation: body mass ratio.

The convenient investigation of the pulmonary exchange of anesthetic agents other than N_2O has not been feasible with previously available analytic methods. Gas chromatography seems to have overcome this difficulty, permitting not only the analysis of all inhalation agents, but the simultaneous analysis of any mixture of these agents.

As an integral part of the gas exchange studies, it has become necessary to develop a method for analyzing for the anesthetic gases and vapors in blood.

The method involves the distillation of these agents from blood, collection of the distillate in their solid phase by immersion in liquid nitrogen, vaporization of the crystalline product into the gas chromatograph where the various substances are separated and measured quantitatively by means of a hydrogen flame ionization detector.

With these techniques it is hoped that a study of the simultaneous uptake and excretion of multiple agents in all age groups including newborns will be possible.

The mechanism for the profound muscular relaxation produced by methoxyflurane has been investigated in collaboration by Professor Ngai, Professor Hanks and Dr. Donald C. Brody. In man and in cats methoxyflurane in anesthetic concentrations does not have neuromuscular blocking activity as tested by peripheral muscle twitch response to indirect stimulation. In decerebrate and spinal cats the spinal reflex was abolished by methoxyflurane in inspired concentration of 0.2%-0.3%; 0.5%-0.6% being required for surgical anesthesia in this species (as tested by the response of the head to various stimuli in the spinal preparation). Other commonly used anesthetics were also studied in a similar fashion for comparison. It was concluded that the muscular relaxation observed during methoxyflurane anesthesia is probably due to its depressant action on the spinal cord.

Professor Ngai studied the antagonism of 3-hydroxyl-phenyl triethyl ammonium, an analogue of edrophonium, on neuromuscular transmission and on neuromuscular block produced by d-tubocurarine and decamethonium. Parallel studies are being carried out with other commonly used neuromuscular blocking agents and other triethyl ammonium derivatives.

In collaboration with Professors Hanks and Fink, Professor Ngai is studying the effect of halothane anesthesia on regulation of respiration in man with accurate measurement of blood CO_2 tension, pH and ventilation. The previous conclusion that halothane in increasing concentrations elevated the carbon dioxide threshold for rhythmical respiration and reduced the responsiveness of the respiratory center to suprathreshold carbon dioxide or H^+ stimulus has been confirmed. A concept has been developed from this work and other studies of Professor Fink that the brainstem activating system (RAS) probably plays an important role in initiating and supporting rhythmical respiration. Anesthetics depress the RAS and therefore reduce or remove this support, in the absence of which a stronger carbon dioxide or H^+ ion stimulus is re-

quired to activate the respiratory center networks. The experimental evidence and concept, however, do not rule out the direct depressant effect of anesthetics on the rhythmical respiratory neurons.

In collaboration with Dr. Ronald Katz, Professor Ngai is studying the effect of diethyl ether on the regulation of respiration in decerebrate cats. Five to ten percent diethyl ether in the inspired air caused transient tachypnea. On continued inhalation of ether, the respiratory rate usually returned to the control level or decreased to a rate slower than control. The tidal volume and minute volume were always reduced. Secondary tachypnea was observed after 30-60 minutes of inhalation. This was usually associated with shallow breathing and elevation of the arterial CO_2 tension. In a preparation with a totally deafferented brainstem diethyl ether caused no initial increase in respiratory rate but a progressive decrease in tidal and minute volume and an eventual increase in respiratory rate. Therefore, the tachypnea observed during diethyl ether anesthesia cannot be wholly explained on the basis of reflex stimulation through sensitization of pulmonary stretch reflexes or other receptors as was previously proposed. Ether is a primary respiratory depressant. The secondary tachypnea is related to the retention of carbon dioxide which is a consequence of reduced tidal and minute ventilation.

Drs. Katz and Richard Matteo have noted that trichlorethylene (TCE) is alleged to produce cardiac arrhythmias in fifty to eighty percent of patients receiving the agent. In a controlled study of 200 patients the incidence of arrhythmias was very small. Maintenance of adequate ventilation and the use of minimal concentrations of TCE are necessary to prevent arrhythmias. 5 cc. of 1:60,000 epinephrine every five minutes to a total dose of 0.5 mg. was injected subcutaneously in patients during TCE anesthesia. No arrhythmias were noted with this dose schedule. As a result of these studies many operations in which epinephrine is used for hemostasis are now being performed under general rather than local anesthesia.

Dr. Katz, in collaboration with Drs. Hsueh-Hwa Wang, Instructor in Pharmacology, and Marvin R. Blumenthal of Princeton Hospital in New Jersey, are using a technique in which the coronary arteries are perfused without placing catheters in branches and without dissecting and damaging the nervous supply of the heart to study the effect of low and high pH of the perfusing blood. The preparation used is an extremely sensitive one. Doses of epinephrine of one gamma produce a dramatic rise in coronary flow and myocardial contractility. Con-

trary to prior work, alkalosis produced by THAM and Na_2CO_3 caused an increase in coronary flow, a decrease in A-V O_2 difference and an increase in myocardial contractility. Acidosis produced by citric acid effected a fall in coronary flow, cardiac output, blood pressure and myocardial contractility. With Professor Ngai and Professor Shih-Chun Wang of the Department of Pharmacology, Dr. Katz showed that the three phases of apneustic respiration were PCO_2 dependent.

Dr. Charles E. Wolf has continued the study of the various respiratory stresses leading to catecholamine release in the dog in collaboration with Dr. Elizabeth C. Gerst, Assistant Professor of Physiology. It has been found that there is release of catecholamines not totally explained by changes in the Pa_{CO_2} or Pa_{O_2} . Work is in progress to define the role of increased muscular activity in this release. Muscular activity similar to that seen in the spontaneously breathing hypoxic dog is being simulated by use of nerve and muscle stimulators and keeping arterial gas tensions at a constant level. At present, there is suggestive evidence that muscular activity does lead to an increase in catecholamine secretion.

Professor Lester C. Mark while on sabbatical leave worked with Dr. Per Lous, Director of Clinical Biochemistry and Physiology, Bispebjerg Hospital in Copenhagen, Denmark. They studied the effects of acid-base balance disturbances in patients who attempted suicide by the ingestion of barbiturates. The anticipated frequency of severe respiratory acidosis did not materialize. Instead, initial pH values were relatively normal, despite respiratory minute volumes of 5-8 liters. Subsequently day by day there was a distinct trend toward elevation of pH to high normal and mildly alkalotic values (7.45-7.50) as recovery progressed, seemingly unrelated to the respiratory minute volume or any of the other parameters examined. The mechanism for the alkaline trend has not as yet been elucidated.

With Professor Leonard Brand and Dr. Peter G. Dayton of the New York University Research Service, Goldwater Memorial Hospital, studies on the blood/brain, blood/spinal fluid and blood/ocular fluid "barriers" were continued by Professor Mark. Thiopental crossed each "barrier" more readily than did barbitol, suggesting that, for the barbiturates at least, passage across these membranes is related to lipid solubility. The studies on the physiological disposition of various intravenous anesthetic agents have been continued. The new barbiturate methohexital appears to be somewhat more quickly metabolized than thiopental and less soluble in body fat.

In vitro, methohexital is slightly less lipid-soluble

than thiopental (partition between peanut oil and water showed sixty-five percent of the methohexital in the oil phase as compared to eighty-nine percent for thiopental); plasma binding for each drug is about seventy-five percent.

With Professor Brand, Professor Eli S. Goldensohn, Assistant Professor of Neurology and Associate Attending Neurologist, and Dr. J. J. Burns, Director of Laboratories, Burroughs-Wellcome Company, Tuckahoe, New York, Professor Mark is studying the mechanism and therapy of convulsions produced by procaine in curarized ventilated dogs. The standard test procedure is sufficiently reproducible to lend itself as a screening device for the study of anticonvulsant drugs. Professors Brand and Mark are examining the question of whether post-ictal depression is mainly the result of local anoxia due to excessive neuronal activity or of the hypoxia and hypercarbia produced by impaired ventilation during the convulsion.

A clinical implication of these studies concerns the relative merits of therapy with barbiturates and with muscle relaxants.

Dr. Joannes H. Karis has been studying the action of hexafluorenum in cooperation with Professor Nastuk of the Department of Physiology.

Dr. Stuart J. Leavitt has been assisting Dr. Fred-eric J. Agate, Associate Professor of Anatomy, and Dr. William A. Silverman, Associate Professor of Pediatrics and Associate Attending Pediatrician, and Dr. Finster in their studies on the problem of the respiratory distress syndrome in premature infants. These workers have constructed a device which is designed to increase the functional residual capacity of the lungs in premature infants who are breathing with retraction, in the effort to determine whether this will improve their survival rate. Dr. Finster has also developed a safe and practical method of providing anesthesia for poisonous reptiles in collaboration with Mr. Charles Hackenbrock, Assistant in Anatomy.

Dr. Lynne Greene is studying the possibility of depositing anesthetic and analgesic agents in the lungs via aerosol methods.

Dr. Stuart Sullivan, as a research fellow under the direction of Dr. William A. Briscoe, Associate Professor of Medicine and Assistant Physician, studied the alveolo-urinary N_2 tension difference in acute bronchitis. The alveolo-urinary N_2 difference which was abnormally elevated in acute bronchitis returned to normal levels in all patients upon complete recovery. Dr. Sullivan, together with Dr. Richard W. Patterson of this department, Professor Malm, and Dr. Frederick O. Bowman, Jr., Instructor in

Surgery and Assistant Attending Surgeon, have undertaken a study of the influence of hemodynamic changes on the metabolic disturbances that are associated with extracorporeal circulation. Dr. Sullivan is also continuing his association with Professor Briscoe in his study of ventilation-perfusion relations in patients with emphysema and bronchitis.

Professor Richard Patterson has continued his studies of vector cardiography in its application to clinical anesthesiology. He is also studying the changes in the oxygen dissociation curve due to ACD blood. He is attempting to correlate these effects with changes in flicker fusion.

Professor Charles C. Wycoff has continued the study of the cardiac glycoside acetyl strophanthidin and its effect on the normal myocardium of the dog. Professor Wycoff has also continued the development of a technique of differential cerebral mypo-thermia in the dog with the intention of using it in the human as soon as feasible.

In the human it is planned to interrupt the circulation to the brain for one hour to allow neurosurgical procedures to be accomplished which cannot be done at the present time. Eleven dogs in succession have survived a standard technique without permanent sequelae. There has been a 24-48 hour transient hind leg ataxia and transient questionable blindness. It is believed that these changes were due to cerebral hypoxia.

Research Fellows

The research fellows in the department have had a productive year. Dr. Richard J. Kitz, since July 1, has been working under the direction of Professor Irwin B. Wilson on the mechanisms and kinetics of sulfonylated analogues of certain anticholinesterases. It was demonstrated that these compounds are potent inhibitors of acetylcholinesterase and should be classed as irreversible inhibitors of this enzyme.

Dr. James J. Lewis will complete a year of research fellowship under the direction of Professor Shih-Chun Wang of the Department of Pharmacology and Professor Ngai. The adrenolytic activity of several phenothiazine compounds on the changes in femoral blood flow produced by intra-arterial epinephrine and norepinephrine was measured and compared. Chlorpromazine (Thorazine) and promazine (Sparine) block or reverse the constrictor action of epinephrine at dose levels of 0.03-0.3 mg/kg. But with higher doses these compounds actually accentuate the constrictor effect of epinephrine. Perphenazine (Trilafon) caused blockade or reversal at dose levels of 0.1-0.4 mg/kg, whereas prochlorperazine (Compazine) and trifluoperazine (Stelazine) do this

at dose levels of 5-15 mg/kg. Even higher doses (5-30 mg/kg) of promethazine (Phenergan) was required to block or reverse the action of epinephrine.

The phenothiazine derivatives studied appear progressively to block the action of norepinephrine but further work is in progress on trifluoperazine and prochlorperazine which appear to be less potent in this respect.

The occurrence of bradycardia, electrocardiographic changes and even transitory cardiac arrest following intravenous injection of succinylcholine chloride during clinical anesthesia has been confirmed by electrocardiographic studies in ten anesthetized patients prior to operation. This effect was associated with the potency of the drug but the action could not be demonstrated at similar dose levels in cats, dogs or rabbits.

Dr. Deborah H. Klonymus assisted Professors Rackow, Salanitro, and Epstein in their investigation of the uptake and excretion of nitrous oxide in infants and children. An analysis of anesthetic agents by gas chromatographic techniques was undertaken and suitable methods for extracting anesthetic agents from blood samples prior to analysis by chromatography were developed. Dr. Klonymus made a survey of surgical procedures in cystic fibrosis patients at the Babies Hospital and analyzed the data with regard to problems in anesthetic management.

Dr. Shirley Markee is spending a year as a research fellow in the Department of Pharmacology in the laboratory of Professor Shih-Chun Wang, working under Dr. Hsueh-Hwa Wang. She is assisting in the following projects: The classis Heymans cross-circulation dog preparation is used to isolate the blood supply of the central nervous system from that of the rest of the body to evaluate possible central vasomotor effects of various tranquilizing agents. Reserpine has not produced depression of the vasomotor center response to electrical stimulation. Chlorpromazine has produced depression of the vasomotor center in 15 to 19 dogs in dosage as low as 0.2 mg/kg. Further studies of other agents are in progress.

The problem of the supersensitivity of denervated blood vessels is under active study. Although the supersensitivity of chemically sympathectomized blood vessels has been well documented, it has not been shown conclusively whether the same phenomenon occurs in acutely sympathectomized vessels. Therefore, the blood flow in the left femoral artery of the dog is compared with that in the right femoral artery after the injection of intra-arterial threshold doses of acetylcholine, norepinephrine, epinephrine and various vasopressors one hour, twenty-four

hours, forty-eight hours and six weeks following left lumbosacral ganglionectomy. Preliminary data indicate that the acutely sympathectomized leg may be more sensitive to norepinephrine and epinephrine, but less sensitive to acetylcholine.

Together with Dr. Marvin R. Blumenthal, Drs. Wang and Markee are studying the effects of drugs on coronary circulatory dynamics in the dog by means of a perfusion apparatus devised by Dr. Blumenthal. This technique permits simultaneous measurement of cardiac output, coronary sinus flow, myocardial contractility, right atrial pressure and arterial blood pressure following injection of agents into the coronary arteries. Vasodilators, such as nitroglycerine, caffeine, and theophylline and vasopressors are currently under study. Further plans include the adaptation of this technique to study the aortic bodies.

The research activities of Dr. Paul J. Poppers are under the direction of Dr. William L. Nastuk, Professor of Physiology, and are centered upon the *in vitro* action of thiamine and its analogues at the myoneural junction. Single nerve-muscle preparations, in which neuromuscular transmission is partially blocked by d-tubocurarine are used for this purpose. The aim is to determine whether thiamine and certain of its analogues will potentiate or antagonize the partial blockade of curare.

Statistics

During the year of 1961, 23,044 patients were anesthetized for surgical operations. General anesthesia was employed in 19,130 of these and regional anesthesia in 3,914. Muscle relaxants were administered on 8,504 occasions. One hundred and fifty patients were tested in the Nerve Block Clinic.

Improved or New Methods of Patient Care

Professors Moya, James and Hanks, with Dr. Eric D. Burnard, have instituted the use of closed chest cardiac massage whenever a recent cardiac arrest is encountered in the newborn. The technique has been used in five full term newborn infants for periods ranging from six minutes to two and a half hours. It was found to be effective in producing adequate blood pressures and improvement of the electrocardiographic patterns without trauma to the bony structures or viscera.

Professor Moya and his staff are continuing their investigation of the use of nitrous oxide-oxygen anesthesia in combination with muscular relaxation produced by succinylcholine for cesarean sections. Preliminary results indicate that this technique compares favorably with spinal anesthesia for cesarean

section and is preferable to cyclopropane if regional techniques are contraindicated.

Dr. Shnider, in collaboration with Professor Moya, is studying the effects of low concentrations (3%-5%) of cyclopropane in producing analgesia during the second stage of labor. One hundred and forty-eight mothers were evaluated for the degree of pain relief and amnesia. It was found that 84% of the mothers had moderate to complete analgesia and sixty percent had partial to complete amnesia. Eighty percent of the babies had Apgar scores of 7-10 and had sustained respirations within one minute. It was concluded that cyclopropane administered in analgesic concentrations is a safe and effective means of producing maternal pain relief with no apparent depression of the newborn.

In the Francis Delafield Hospital a Pain Clinic was established by the Department of Neurological Surgery in which the Department of Anesthesiology has been participating. It has been meeting every other week to discuss specific problems and to consider the various methods used in the treatment of pain.

Several major additions to monitoring equipment have been made in the neurosurgery operating rooms. Electrocardiograms are now observed continuously in every patient. Apparatus for determining arterial pH PCO_2 has permitted precise evaluation of the efficiency of ventilation during intracranial operation, allowing critical adjustment of mechanical ventilation for optimum conditions in the operative field. Use of mechanical ventilators, ventilation meters, electrocardioscopes and thermistors have become standard procedure in major neurosurgical operations. However, only some of the numerous blood examinations desirable for anesthetic care (serial hematocrit, blood volume, electrolytes, acid-base balance) can yet be made. These will eventually require a clinical laboratory and technician for the Anesthesiology Service in the Neurological Institute.

Professor Hanks and Dr. Ferdinand F. McAllister, Assistant Professor of Clinical Surgery and Associate Attending Surgeon, have instituted teaching exercises and demonstrations of closed chest resuscitation for members of the attending, house and nursing staffs at the Medical Center. Professor Hanks served as a consultant in the preparation of the movie on closed chest resuscitation which was filmed at the Johns Hopkins Hospital.

Professor Charles C. Wycoff instituted hyperventilation of patients who are having intracranial operations. This technique reduces the size of the brain and provides improved operating conditions for the surgeon. Patients who are having operative procedures in the posterior fossa are allowed to breathe spontaneously so that the surgeon will recognize any trauma to the respiratory center as evidenced by a respiratory arrhythmia.

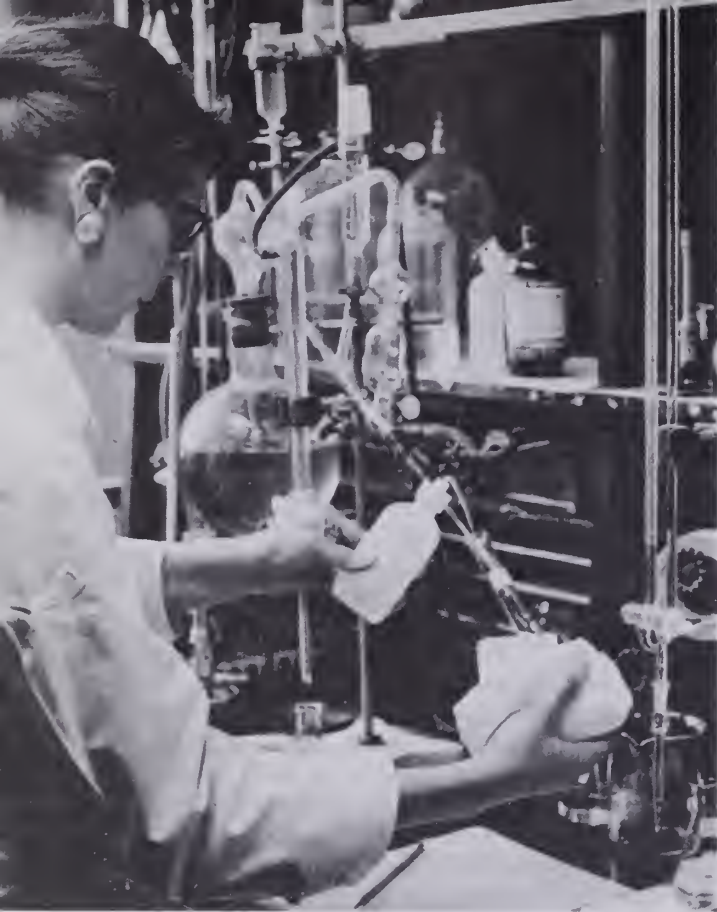
Particularly grateful acknowledgment for support of research in anesthesiology is made to the National Institutes of Health of the United States Health Service, the Department of the Army, the New York Heart Association, the Burroughs-Wellcome Fund, Abbott Laboratories, Geigy Pharmaceuticals, United States Educational Foundation in Denmark (Fulbright Commission), John Simon Guggenheim Memorial Foundation, National Aeronautics and Space Administration, and to the Charles B. Wrightsman and Palisades Foundations.

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Other Activities

Professor Nahas organized a highly successful conference on organic buffers for the New York Academy of Sciences. Professor Ngai was appointed a member of the Committee on Anesthesia of the National Research Council. Dr. Virginia Apgar, a former Professor in the department, was given the Distinguished Service Award and Honorary Membership in the American Society of Anesthesiologists. Professor Papper was a founder and elected first Chairman of the new Section on Anesthesiology of the New York Academy of Medicine. He was also elected a Corresponding Member of the Association of Anaesthetists of Great Britain and Ireland, and a Fellow of the Royal Society of Medicine of England.



Biochemistry

DAVID RITTENBERG

*Professor and Chairman
of the Department*

Instruction in biochemistry has been given to first year medical and dental classes and to forty-six students under the graduate faculties. Of the latter, thirty-eight had their major interest in biochemistry and eight in other departments of the University. There are also fifteen postdoctoral fellows receiving training in the department. All members of the department have active research programs, support for which comes largely from outside sources.

The following members of the staff have resigned to take up positions elsewhere: Professor Erwin H. Mosbach, to the Public Health Research Institute of the City of New York; Professor George Aes, to the Institute for Muscle Disease, New York City; Professor George Brawerman, to Yale University, and Dr. Jack Horowitz, to Iowa State University. Dr. Harry W. Dougherty has been added to the staff at the rank of Instructor and six new Research Associates were nominated to the department. They are Drs. George I. Birnbaum, Ernest D. Gray, Erlio Gurpide, Leslie Robert, Nikola Z. Stanaev and Keizo Tsushima. Dr. Parithychery Srinivasan has been on leave during the academic year, working in

the laboratory of Dr. J. Brachet in Brussels, Belgium.

Professor David Rittenberg has continued his studies of the metabolism of hydrogen in certain microorganisms and on the metabolism of glucose in *E. coli*. He has been assisted in this work by Dr. Raghunandana Rao of India.

Professor Erwin Chargaff, in collaboration with Drs. Brawerman, Gray, Horowitz, Abraham Rosenberg, Rivka Rudner, Herman S. Shapiro and Stanaev, continued the work on the chemistry and biology of both deoxyribo- and ribonucleic acids, the mechanisms of cell differentiation, the chemistry and function of complex brain lipids, and certain aspects of the chemistry of neuraminic acid. Visiting scholars participating in the work included Dr. Anne M. Haywood (California Institute of Technology), Dr. S. Morisawa (Kyushu University, Fukuoka, Japan), Miss Marie-Madeleine Neulat (University of Lyons, France), Dr. P. Rüst (Zurich), and Dr. J. H. Spencer (McGill University). Dr. Haywood is a Postdoctoral Fellow of the American Cancer Society. Miss Neulat is the holder of a French Government scholarship.

Professor Samuel Graff and his associates, Professors Horace B. Gillespie, Aaron D. Freedman and Hermann Moser, and Mrs. Ada M. Graff at the Francis Delafield Hospital, continued their investigations on the biochemical characteristics of cancer and the environmental and hormonal influences on metabolic events in cultured cells and intact animals.

Professor Reinhold Benesch and Dr. Ruth E. Benesch have continued their work on the relation between structure and function in normal and pathological hemoglobin. Dr. Ruth Benesch lectured at the Gordon Conferences on Proteins in June and Professor Reinhold Benesch lectured to the American College of Physicians in February, at the University of Chicago in May, at the University of Iowa, the University of Wisconsin and Purdue University in October, and to the New York Society for the Study of Blood in December.

Dr. Ernest Borek has continued his researches on the biochemical mechanism which results in cellular damage from radiation energy. As a model system he has studied the mechanism of the conversion of a latent bacterial virus to virulence by ultraviolet or X-radiation. The radiation effects seem to be expressed through a stable product of irradiation which can be transferred from cell to cell without loss of biological activity. Studies of RNA metabolism revealed that the structure of this polymer can be significantly altered during methionine starvation of a specific microorganism. This observation is being extended since it is expected to contribute to our understanding of the interrelationship between RNA structure and its function in protein synthesis. A completely deuteriated enzyme has been successfully prepared and studied for the first time. The following participated in this work: Dr. Elsie Wainfan, Mr. Stephen Rittenberg, a medical student, and Miss Ann Ryan, Mr. Lewis R. Mandel, and Mr. Erwin Fleissner, all doctoral candidates.

Professor Max Eisenberg has continued his study of the mechanism of biotic biosynthesis.

Professor Alvin I. Krasna has continued his studies on the adaptation of the enzyme hydrogenase in photosynthetic algae. The effect of light on this process and the nature of the active grouping of the enzyme were investigated. In collaboration with Professor Rittenberg, he has studied inhibition of hydrogenase by carbon monoxide and its reversal by light. He has continued his investigations on the inhibition of enzyme system by fluoromalic acid. The stereochemical configuration of two isomers of β -fluoromalic acid was established.

Professor Barbara W. Low has continued her X-ray crystal structure studies of the protein hor-

mone insulin and the peptide hormone oxytocin. The aim of this research is the determination of the complete molecular structure of these compounds. These studies were carried out in collaboration with Drs. George I. Birnbaum, J. Ralph Einstein, W. Kenneth Grant, Robert Sparks and Yoshio Sasada. Work on the crystal structure of fluoromalic acid is also in progress.

Professor David Shemin, in collaboration with Dr. Keizo Tsushima, visiting scholar from The Nippon Medical School, and with Dr. Barbara Robert of the Medical School of Paris, has been investigating the synthesis of enzymes in cell-free preparations of *E. coli* and photosynthetic bacteria. In collaboration with Professor Lewis P. Rowland, Assistant Professor of Neurology and Assistant Attending Neurologist, he has been concerned with the metabolism of δ -aminolevulinic acid in acute porphyrins in order to find the biochemical lesion in their hereditary abnormality. In collaboration with Dr. Richard Bray, he has studied the biosynthesis of vitamin B₁₂ and this work is also being continued with Dr. I. Aravindakshan Menon from the Cancer Research Centre. In collaboration with Miss Tessa Abramsky and Dr. Lewis P. Rowland, he has studied the formation of isoleucine from β -methylaspartic acid. The latter compound is derived from glutamic acid from a B₁₂ dependent enzymatic reaction. In collaboration with Dr. Sheila Garrett, he has begun an investigation on the synthesis of a pyridine derivative from glycine and acetoacetic acid.

Professor David B. Sprinson has spent the academic year 1960-1961 on sabbatical leave in the Department of Biochemistry at the University of Oxford. His co-workers continued investigations of intermediary reactions in the biosynthesis of phenylalanine and tyrosine in bacteria: the reaction of enolpyruvate phosphate with shikimate 5-phosphate to yield 3-enolpyruvyl shikimate 5-phosphate (which was isolated for the first time), and the conversion of the latter to prephenic acid; resolved β -aminoisobutyric acid-N¹⁵ and studied its behavior in human subjects; investigated several approaches to the synthesis of 5-N-methylfolic acid. Collaborating on these problems were Drs. Milton Sprecher, Mary D. Chalmers, Mary J. Clark, Mrs. Judith G. Levine and Mrs. Muriel Sackler.

Professor Stephen Zamenhof, in collaboration with Drs. Sheldon Greer, Erela Elizur, Eugene Rosenberg and Rosalie de Giovanni, has conducted studies on the gene unstabilization induced by heat and by nitrous acid, on histidine linkage groups in *Bacillus subtilis*, on depurination of deoxyribonucleic acid by heat, on induction by mutations by

deuterium, and on new polysugarphosphates.

Dr. Gerald Phillips has studied serum and tissues for unknown phospholipids and estimation of the individual phospholipids in the serum and red blood cells of patients with diseases, especially those associated with hyperlipemia. He has analyzed bile and chyle for individual phospholipids.

The departmental seminars were addressed by distinguished visitors, among whom were Dr. Martin Flavin and Dr. Michael Sela of the National Institutes of Health; D. E. Koshland, Jr. of Brookhaven National Laboratories; Hans Gaffron of Florida State University, Tallahassee; E. A. Evans, Jr., University of Chicago; J. Halpern, University of British Columbia; Ernst B. Chain, Instituto Superiore di Sanita, Rome; T. C. Bruice, Cornell University; Paul K. Stumpf, University of California at Davis, California; D. L. D. Caspar, Children's Cancer Research Foundation, Boston; Harriet Bernheimer, Downtown Medical Center, State University of New York; Frederic M. Richards, Yale University; Edgar Lederer, University of Sorbonne; David Elson, Weizmann Institute of Science; Arthur B. Pardee, University of California, Berkeley; Saul Adler, Hebrew University, Jerusalem; Joseph Huppert of the Pasteur Institute; Howard Holtzer of the University of Pennsylvania; K. Sebesta of the Czechoslovakian

Academy of Science, Prague; Philip George, University of Pennsylvania; J. C. Laurent of the Retina Foundation, Boston and University of Upsala, Sweden; Jacques Monod of the Institut Pasteur, Paris; Carolyn Cohen of Harvard University; Rachmiel Levine, Flower and Fifth Avenue Hospital; E. M. Kosower, State University of New York at Oyster Bay; Maurice Rapport of the Albert Einstein College of Medicine; C. deDuve of the University of Louvain, Belgium; I. Bernard Weinstein of the Delafield Hospital; A. Katchalski of the Weizmann Institute of Science, and Sidney Udenfreund of the National Heart Institute, National Institutes of Health.

Acknowledgment

The activities of the department received generous support during the year through grants from the American Cancer Society, the American Heart Association, the Atomic Energy Commission, the Office of Naval Research, the National Science Foundation, the National Institutes of Health of the United States Public Health Service, the Rockefeller Foundation, the Damon Runyon Memorial Fund for Cancer Research, Inc., the Health Research Council of New York, and the E. I. du Pont de Nemours and Co.



Dental and Oral Surgery

GILBERT P. SMITH

Dean of the Faculty of Dental and Oral Surgery · Director of Service

The undergraduate and postgraduate teaching programs, together with associated clinical activities, have required the major attentions of the staff. Research and Hospital Dental Service, other areas of prime significance, were limited in scope and effectiveness by inadequate space, facilities and support. The dental academic staff has served faithfully and loyally, but has great concern for the development of the School if it is to maintain its place as a leader in dental education.

It is with sorrow that we record the deaths of Drs. Arthur Hastings Merritt and Adolph Berger. Dr. Merritt, who was one of the founders of our School, passed away on February 9, 1961, in his ninetieth year. In his sixty-five years in dentistry he was recognized as an outstanding practitioner, author,

historian, and inspiring teacher. He served his profession as President of the American Dental Association, the American College of Dentists, the American Academy of Periodontology and the American Academy of History of Dentistry.

Dr. Berger, William Carr Professor Emeritus of Oral Surgery, died on April 14, 1961, in his seventy-eighth year. He served as a teacher of oral surgery from 1912 until his retirement in 1951. Dr. Berger was a prolific writer, author of several texts; a devoted teacher and an understanding friend to all who were fortunate enough to be associated with him.

New appointments to the Department of Dental and Oral Surgery were: Miss Joan L. Catherman as Assistant in Dental Hygiene; Dr. Manual M. Mas-

lansky as Associate Clinical Professor and Dr. Seymour Zeff as Assistant Clinical Professor in the Division of Oral Surgery; Dr. Saul N. Greenberg as Instructor, Drs. James G. Coyle and Gustave Lasoff as Assistants in the Division of Orthodontics; Dr. Morris Eckhaus as Associate Clinical Professor, Dr. Harry Shpuntoff as Instructor, Drs. Merrill K. Gellis and Jack Rosen as Assistants in the Division of Restorative Dentistry; and Drs. Alvin D. Cederbaum, Robert E. Crowley, Albert Salkind and Robert Umans as Instructors, and Dr. John K. Lind as Assistant in the Division of Stomatology.

The following promotions were effective July 1, 1961: Division of Oral Surgery — Drs. Louis J. Loscalzo, Louis Mandel, George Minervini and Harold Baumash from Instructor to Assistant Clinical Professor; Division of Orthodontics — Drs. Francis J. Loughlin and Armand Oppenheimer from Assistant to Associate Clinical Professor, Drs. Joseph Luban and Edward E. Teltsch from Instructor to Assistant Clinical Professor, Dr. Sidney L. Horowitz from Research Associate to Assistant Clinical Professor, Drs. Paul I. Addison and David Blistein from Assistant to Instructor; Division of Pedodontics — Drs. Mark Benes and Albert Green from Assistant to Instructor; and the Division of Stomatology — Drs. Ida M. Golomb and Bernard H. Wasserman from Instructor to Assistant Clinical Professor.

Leaves of absence were granted to Professors Harold Sherman, Clifford L. Whitman and Joseph Fiasconaro and Drs. Lawrence A. Marder and Janice Schreiber.

Dr. Donald L. Olson resigned from the Division of Stomatology to accept a teaching post at the Dental School of Fairleigh Dickinson University. Other resignations were received from Drs. Jack Rosen, Lawrence Daum, Robert J. Kelley and Nicholas R. Napoli. Professor Robin M. Rankow withdrew from the Department of Dental and Oral Surgery and was transferred to the Department of Anatomy.

The Dental School's staff has continued to be active in professional affairs both at home and abroad. Professor Lester Richard Cahn, of the Department of Pathology, was awarded the Degree of Doctor of Science (Honoris Causa) by the University of Leeds on June 21st and presented the *Frank C. Wilkinson Lecture* at the University of Manchester, England, on October 24th. In addition, he presented lectures before the Royal Society of Medicine in Landau and before dental societies in Hobart and Launceston, Tasmania; and Melbourne, Perth, Adelaide, and Sydney, Australia. Professor John J. Lucca presented lectures before the Puerto Rico Dental Association and the University of Puerto Rico Dental

School in San Juan, Puerto Rico.

Professor Solomon N. Rosenstein was inducted as an Honorary Member of the Alpha Omega Fraternity. He served as Co-Chairman of the Dental Guidance Committee of the United Cerebral Palsy of New York, Inc.; as a member of the Clinical Advisory Committee of the United Cerebral Palsy Research and Educational Foundation, Inc., and as Editor of the *Bulletin of the Dental Guidance Council for Cerebral Palsy*.

Professor Gilbert P. Smith served as Chairman of the Council of the Greater New York Academy of Prosthodontics and as a member of the American Board of Prosthodontics. Professor Edward V. Zegarelli was awarded the D. Austin Sniffen Medal of Honor by the Ninth District Dental Society of the State of New York for distinguished service to his profession. Professor Frank E. Beube was honored by the dedication to him of the October issue of the *Journal of Periodontology*.

The registration of the School of Dental and Oral Surgery in September, 1961, was as follows:

First Year.....	37
Second Year.....	35
Third Year.....	34
Fourth Year.....	38

There were twenty students registered for non-credit postgraduate courses and thirty-seven for postgraduate credit courses. Fourteen were enrolled in the first year class of Courses for Dental Hygienists and fifteen in the second year class. One student was enrolled for the Master of Science degree in administration, supervision and clinical teaching of dental hygiene.

Postgraduate programs leading to certificates in orthodontics, periodontology and pedodontics had a total of thirty-five students admitted during the year. From a total of 172 applications, twenty-two were selected for the course in orthodontics.

The number of patients who received treatment in the clinics of the School of Dental and Oral Surgery was 6,591. Of these, 3,074 were referred from Vanderbilt Clinic and Presbyterian Hospital while 3,517 were Dental School patients. There were 58,982 patient visits made, of which 1,080 were to the Hospital Dental Service, 1,029 to Dental Hygiene, 8,557 to Orthodontia, 326 to the Temporomandibular-Joint Clinic, 5,519 to Radiology, 1,422 to Pedodontia, 1,290 to Cerebral Palsy, 10,488 to Oral Surgery, 6,513 to Prosthodontia, 6,225 to Operative Dentistry and 2,927 to Periodontia. There were 450 complete dentures, 124 removable partial dentures and 1,045 crown and fixed partial denture units

placed in the Prosthetic Clinic. In the Operative Dentistry Clinic 1,857 amalgam fillings, 577 gold fillings, 576 inlays and 442 synthetic fillings were placed.

The Division of Oral Surgery has completed its first full year under the direction of Professor Rudolph H. Friedrich. During the year, a revision of the didactic program of the division reported last year was followed by a reorganization of the clinical teaching program and reorganization of assignments to the oral surgery staff.

A twenty-five percent increase in patient load has been experienced during the past year by the Oral Surgery Clinic. The division provided consultation on 313 Presbyterian Hospital ward patients and provided surgical care to 3,391 patients from the dental school clinics.

A new program in postgraduate oral surgery has been established, along with a similar program in prosthodontics through an affiliation with Grasslands Hospital, Westchester County, New York.

Professor Nicholas A. Di Salvo directed the activities of the Division of Orthodontics. The postgraduate orthodontic course, which is the major activity of the division, has been broadened by the inclusion of courses in cephalometrics, growth and development, temporomandibular joint dysfunction and orthodontic diagnosis. The course in therapeutics has been expanded and a weekly seminar in treatment planning has been instituted.

In July the division presented a one-week course in preventive orthodontics for general practitioners for the first time. Short courses given for orthodontists were cephalometrics, by Professor Henry I. Nahoum, and edgewise arch mechanism, by Professor Whitman.

Professor Di Salvo and Dr. Coyle, with the assistance of postgraduate students in orthodontics, are engaged in a post-retention study of patients treated in the orthodontic clinic. Professor Horowitz is engaged in a study of variation in the cranial and facial skeleton in post-adolescent subjects together with Dr. Robert Thompson of the Division of Stomatology. Drs. Solomon N. Katz and Abraham Blechman are continuing their study of electromyography and temporomandibular joint radiography. Dr. Nahoum is doing studies on cephalometrics and, together with Dr. Irwin Steuer, on growth and development of the dentition. Dr. Steuer is also engaged in a cephalometric appraisal of treated class II, division 2, malocclusion groups. Dr. Frederick Norman is beginning studies on the effects of physiologic bottle feeding and functional exercises on occlusion. In addition, members of the postgraduate

orthodontics class of 1962, under the supervision of Professor Di Salvo and other members of the staff, are engaged in the following studies — "Time and motion study in orthodontic practice," "Cranial base structure in cephalometric analysis," "Effects of muscular forces on occlusion," "Cephalometric evaluation of relationship between soft tissue profile changes and dentoskeletal changes after orthodontic treatment," "Correlation of genetic influence to incidence of malocclusion" and "Investigation of four cephalometric angles in normal untreated dentition."

The orthodontic clinic provided 8,557 patient visits. Of these, 2,005 visits were made by patients of the Vanderbilt Clinic. 552 consultations were afforded and the number of patients receiving active orthodontic treatment averaged 321 throughout the year, each patient making approximately one visit every three weeks. In addition, about 55 patients were seen on an observation basis at varying periods during the year.

The Division of Pedodontics, under the direction of Professor Rosenstein, has conducted an active postgraduate program in addition to the undergraduate teaching program. This included three Cerebral Palsy Clinical Fellowships in Pedodontics; four other postgraduate students were in training for the specialty of pedodontics, two of whom are dentists from Argentina and Japan.

The teaching material, at both undergraduate and postgraduate levels, was revised to permit greater emphasis on specific measures for preventive dentistry, tooth conservation, and dental care for young pre-school age children. The procedure for topical application of eight percent stannous fluoride, instituted during the latter part of the preceding year, was practiced routinely as an accepted preventive measure, readily applied clinically and having great teaching value.

In the postgraduate training activity there were three major developments:

1. Beginning in September, 1961, affiliation was effected with the Nassau County Cerebral Palsy Treatment Center in Roosevelt, New York, a large, well-directed, multi-discipline facility for the cerebral palsy population in Nassau County;
2. The postgraduate pedodontic course has been strengthened by inclusion of course assignments for study and training in a broader area of handicapping conditions;
3. The clinical training for both the Cerebral Palsy Fellows and the Postgraduate Pedodontic Students was expanded in regard to number of patients treated and the types of handicapping conditions involved.

The research studies in the division continued to

be closely related to fundamental aspects of pedodontic service, namely, prevention of dental disease, prevention of the common disorders of the soft tissues and of the developing occlusion, clinical aspects of dental development, and important factors in dental care for handicapped patients.

Professors Rosenstein and William A. Verlin and Dr. Arnold Rosenberg continued their study on the relation of pyridoxine as a dietary supplement to caries incidence in school children. Professor Rosenstein continued his study on rampant caries in young children with particular reference to its relation to early feeding habits. Long range studies in conservation of children's teeth were continued with the current phase conducted by Professor Rosenstein and Dr. Philip Kutner. The purpose of these studies is to help lessen the incidence of premature loss of children's teeth, which is responsible for a large percentage of cases of malocclusion.

Professor Rosenstein, Dr. Albert Green and Professor Austin H. Kutscher of the Division of Stomatology completed a study on the use of the automatic action toothbrush as an aid to home care for patients with cerebral palsy. This instrument was found to be effective in eliminating materia alba and lessening incidence of gingival inflammation in patients with cerebral palsy.

Dr. Elliott Gordon and Professor Rosenstein conducted an investigation into significance of hypoplasia in deciduous teeth in children with cerebral palsy. This investigation was extended to integrate these findings with comparable findings of hypoplasia in deciduous teeth in young survivors of prematurity in order to study possible relation to prenatal factors. Dr. Seymour Koster continued a study of orthodontic treatment in cerebral palsy to evaluate the feasibility of such treatment in older children with neuromuscular disturbance involving the oral musculature.

Two active clinical programs were conducted with excellent cooperation of the teaching staff. In the Children's Clinic, mainly for undergraduate activity, 141 children from one to eleven years of age were admitted for complete diagnosis and treatment; there were 1,422 visits. In addition to instruction in home care and other preventive measures, there was a total of 59 completed procedures and treatments. This included 52 cases involving pulp management procedures necessary to save teeth which otherwise might have been condemned to premature loss.

In the Cerebral Palsy Dental Clinic, entirely for postgraduate activity, 740 patients with cerebral palsy and other severe handicapping conditions were admitted for complete dental care. There were 1,290

visits and 62 completed treatments. The successful management of these patients, whereby ninety-seven percent have been treated under normal conditions and only three percent have required general anesthesia for their dental procedures, contributed to their general habilitation as well as to maintenance of good dental and oral health.

The Division of Restorative Dentistry, under the direction of Professor Smith, concentrated its efforts on the undergraduate teaching program. Closed circuit television was introduced in the teaching of technics in the laboratory and was used for clinical demonstrations with great success. High speed cutting equipment which permits more rapid and effective tooth reduction was made available for student training.

The restorative clinic was, for the first time, kept in operation through the months of June and July. This was done to improve both the teaching program and the care given patients. The third year class was given the opportunity to serve voluntarily during the summer period, and about two-thirds of the students availed themselves of the privilege. The additional clinical activity resulted in an easier transition for the students into the fourth year.

Research activities of the division included continued study of jaw relations and functions by electromyographic analysis by Professors Lucca and Robert E. Herlands and Dr. Shpuntoff. Professors Louis A. Cohn and Ennio L. Uccellani are investigating various aspects of mandibular movement. Professors Lucca, Herlands and Kutscher are studying various drugs which may hasten tissue healing after insertion of immediate complete dentures. Professor Herbert D. Ayers, Jr., has undertaken a study of amalgam joints under a National Institutes of Health grant. Professors Edward A. Cain and Thomas W. Portway are continuing their study of the systemic absorption of mercury after the insertion of amalgam fillings. Professor James W. Benfield has developed special trays for quadrant and full arch construction of multiple restorations. Dr. Kenneth C. Deesen has developed a technic for in vivo photomicrography of tissues at 200 diameters. Professors Joseph M. Leavitt and Irving J. Naidorf are investigating methods for the sterilization of the endodontic armamentarium and have developed a culture media particularly well suited for use in endodontics.

The Division of Stomatology, under the direction of Professor Zegarelli, has conducted an active program in clinical research in addition to both undergraduate and postgraduate assignments.

The members of the division staff have given 126

extra-curricular lectures and courses for national, state and local dental societies, dental schools and specialty groups in foreign countries as well as our own. Thirty-nine papers were published in various dental and medical journals by the members of the Division of Stomatology during the past year.

In an electrophoresis study, Professor Mandel and Dr. Solon A. Ellison, Assistant Professor of Microbiology, were able to separate seven component fractions from parotid saliva. Albumin, alpha, beta and gamma globulins composed twenty-five percent of the total. Salivary proteins included amylase, two non-antigenic glycoproteins and an unidentified antigenic cationic protein. In another study, they reported the identification and assays of free and protein-bound carbohydrates found in human parotid saliva. Together with Dr. Berge Hampar, Visiting Fellow in Microbiology, they found that salivary calculus is rich in carbohydrate and the latter appears to be similar to that found in other ectopic calcifications.

Professors Zegarelli and Kutscher, together with Dr. Carolyn Denning, Associate in Pediatrics and Assistant Attending Pediatrician, and Dr. Dorothy H. Andersen, Professor of Pathology (Pediatrics), Attending Pathologist and Assistant Attending Pediatrician, have extended their investigations of discolored teeth in patients with cystic fibrosis of the pancreas. Human observations as well as studies in rats and dogs indicate that administration of tetracycline may be responsible.

Professors Zegarelli and Kutscher with Dr. Carlos P. Dalmau, Research Associate in Psychiatry, have studied a group of patients with recurrent ulcerative stomatitis and have reported that psychogenic factors are definitively related to this disturbance as well as to idiopathic orolingual paresthesias.

That the activity of topically applied triamcinolone acetonide to oral mucosal lesions is local rather than systemic and that any systemic action in the dosages used is not detectable has been demonstrated by Professors Zegarelli and Kutscher. In collaboration with Professor Edmund Applebaum, Associate Professor of Dental Anatomy, they showed that massive dosages of triamcinalone acetonide did not produce deleterious effects on the oral hard and soft tissues of normal monkeys. The improved effectiveness of incorporating this same corticosteroid in a powdered adhesive vehicle for topical application to acute and chronic oral mucosal lesions was also demonstrated.

Professors Zegarelli and Kutscher reported on the nature and significance of denture stomatitis, together with the usefulness of various effective thera-

peutic approaches in its management. They have published extensive atlases of Peutz-Jeghers Syndrome and Familial White Folded Dysplasia. The present philosophy concerning the nature of the cementoma and fibrous dysplasia of the jaws has been reported by them. The treatment problem of the hemophiliac in the dental clinic was the subject of a statistical study, the results of which emphasized the need for maximum care as a prophylactic measure. Not only would this reduce the amount of operative care ultimately required but, more important, the health hazard and hospital costs would be drastically reduced.

Professor Mandel and his associates are continuing their studies of salivary composition and its relation to oral and systemic disease. The saliva of caries-active and caries-immune patients are being compared and the results suggest that caries-free females have considerable less carbohydrate content and that the qualitative composition of glycoprotein is different from that of caries-free males. The qualitative and quantitative studies of saliva from patients with cystic fibrosis of the pancreas are yielding interesting but as yet inconclusive results. Analyses of saliva from patients with salivary gland disease are being carried out. Samples are being sent to this laboratory from various hospitals in the city. A joint project of investigating the salivary composition of patients with tumors of the parotid gland has been undertaken with the Sloan-Kettering Institute.

Investigations on the carbohydrate content of salivary calculus are completed. Efforts are now being directed at determining the protein composition.

Professor Beube is continuing his studies of implantation of various calcific substances which may promote bone healing in periodontally involved regions. Professor Robert Gottsegen is investigating the relationship of diabetes mellitus and periodontal disease. Professor Melvin Morris is continuing his studies on periodontal wound healing. Drs. Herbert I. Oshrain and Salkind have initiated an investigation on the nature of tissue exudate in periodontitis.

Professors Zegarelli, Kutscher and Applebaum, in a joint project with Dr. William Silverman, Associate Professor of Pediatrics and Associate Attending Pediatrician, are investigating the hypoplastic defects and discoloration of teeth noted in ex-premature infants and children. Professors Zegarelli and Kutscher are continuing their studies of the oral manifestations of cystic fibrosis of the pancreas patients with Professor Andersen and Dr. Denning of Pediatrics. Topical therapy of a number of diverse acute and chronic oral mucosal lesions is being investigated by various members of the Stomatology

staff. Results continue to indicate that local therapy with corticosteroids offers an effective approach supplementing systemic treatment in such disease states as erythema multiforme, pemphigus, lichen planus and desquamative gingivitis.

The limited facilities in the Division of Stomatology including the clinic areas and research laboratories are so severely restrictive that important and highly desirable research projects cannot be initiated. Although additional personnel and equipment could be obtained through the financial aid of federal agencies, the lack of adequate working space precludes the success of such efforts.

The School of Dental and Oral Surgery gratefully acknowledges contributions by the following organizations and individuals which have permitted us to continue our ambitious research program: E. R. Squibb and Sons, Squibb Institute for Medical Research, Bristol-Myers Company, United States Public Health Service, Ciba Pharmaceutical Products, Inc., Geigy Chemical Corporation, Astra Pharmaceutical Products, Revlon Corporation, Warner-Lambert, National Cystic Fibrosis Foundation, and the Joseph and Mollie Kohn Foundation. We also gratefully acknowledge contributions from individuals who wish to remain anonymous.

Dermatology

CARL T. NELSON

*Professor and Chairman
of the Department*

Director of Service



During 1961, outpatient visits to Dermatology in Vanderbilt Clinic numbered 30,157. There were 117 admissions to the dermatologic ward and 1,011 in-patients were treated in consultation with other services. The serological research laboratory performed 614 specific treponemal immobilization tests for patients admitted to various services of the Medical Center and the mycology laboratory examined 2,850 specimens.

There were no major changes in the undergraduate curriculum or the graduate training program for residents and fellows in this department during 1961. Elimination of the year-end examination period now provides additional teaching time for third year medical students.

Staff Changes

Professor Beatrice M. Kesten retired on December 31, 1961, after thirty-seven years of loyal and distinguished service. A graduate of the College of Physicians and Surgeons, Professor Kesten began her career in this department under the direction of the late Professor J. Gardner Hopkins. A physician

of broad and varied interests, Professor Kesten was an exacting teacher, a productive investigator, and a skillful clinician. She also had the distinction of being the first woman to be elected to membership in the American Dermatological Association, and to serve as President of the American Board of Dermatology.

Dr. Max Liebmann, Attending Dermatologist in Vanderbilt Clinic, reached retirement age during the year and was transferred to the inactive list. Dr. Liebmann has given many years of effective service to the Medical Center and has earned the gratitude of the entire departmental staff. Professor Gerhard K. Steigleder resigned on June 30, 1961 to become Associate Professor of Dermatology at the University of Frankfurt, and Dr. Herbert L. Kraut, Assistant Dermatologist in Vanderbilt Clinic, resigned as of November 1, 1961.

Dr. Charles F. Post was advanced to the rank of Assistant Clinical Professor, effective July 1, 1961. New appointees to the staff during the year were: Dr. Lewis Shapiro as Instructor in Dermatology and Associate Attending Dermatologist in Vanderbilt

Clinic, and Drs. Theodore A. Labow, Frank R. Nataro, Lilianna Sauter, and Armando Silva, Jr., as Assistant Dermatologists in Vanderbilt Clinic. Dr. Shapiro will be in charge of the dermatological pathology laboratory and graduate teaching in dermal histopathology.

Research Studies

Professor Leslie P. Barker and Dr. Paul Gross continued their investigation of the clinical and histopathologic characteristics of atrophic and sclerosing lesions of the female genitalia. Professor Barker also initiated a histologic study of the development of keratoses and epitheliomas in lentiginos and other presumably benign pigmented lesions of the skin. Professor Helen O. Curth and Dr. I. Lester Firschein, Instructor in Anatomy, extended their investigation of the relationship of acanthosis nigricans to cancer. This work now includes extensive genetic studies of the probands' families.

Dr. Bohdan E. Dobias continued his studies of the effects of a cell extracted prepared from *C. albicans* on transplantable tumors and leukemias in mice. In collaboration with Dr. Pierre Bois of the University of Montreal, Dr. Dobias also undertook a study of the endocrinologic effects of this extract in rats. Professor Anthony N. Domonkos studied the efficacy of cyproheptadine in the treatment of certain types of non-cicatricial alopecia. He also initiated an investigation of the relative effectiveness of current methods used in the treatment of epitheliomas of the eyelid. Dr. Elizabeth L. Hazen made further observations on the factors affecting asexual sporulation in *M. audouini* and also began exploratory experiments designed to obtain the sexual phase of this pathogen.

Professor J. Lowry Miller continued his studies of the characteristics of the globulin fractions found in the blood of patients with persistent biologic false positive reactions for syphilis. It is hoped that additional data on the nature of these globulins will ultimately help to distinguish patients in whom the false positive reaction carries serious prognostic implications from those in whom it is of little significance. Professor Post, with Dr. Einar A. Juhlin, studied the prevalence of infestation of eyelashes with the mite, *Demodex*. This parasite, a common inhabitant of oily skin, apparently also infests eyelashes and may be a factor in some cases of chronic blepharitis. Dr. Saul L. Sanders and Dr. Irving Abrahams have undertaken a follow-up study of patients with generalized erythroderma seen at the Medical Center between 1930 and 1960. This work

is still in progress, but it promises to contribute significantly to our understanding of the etiology and prognosis of these difficult cases.

Utilizing microradiographic techniques, Dr. John T. McCarthy and Mrs. Mary Nurnberg have undertaken studies to compare the absorption of x-rays in normal and psoriatic skin. Data obtained thus far indicate that the absorption of x-rays in abnormal psoriatic horny layers is greater than in normal keratinized stratum corneum. This is due to the increased dry weight of the abnormal horny layer. There is also evidence to suggest that psoriatic parakeratosis is accompanied by disturbances of the entire biological system of the horny layer as well as keratinization itself. Dr. Leo Schweich, with Drs. Paul G. Meyer and Richard A. Walzer continued the study on the effectiveness of combinations of anti-malarial drugs in the treatment of chronic discoid lupus erythematosus. It has been reported elsewhere that corneal opacities frequently result from the long-term use of these drugs, but the results of the studies here have not borne this out.

Professor Margarita Silva and Miss Helen R. Buckley continued the investigation of the protein fractions of egg white which inhibit the growth of dermatophytes and systemic fungal pathogens. Further observations were also made on the effect of amino acids on the growth of *T. rubrum*. Cysteine, previously found to be completely inhibitory when employed as the source of nitrogen, still exerts complete inhibition in the presence of human stratum corneum *in vitro*. The other inhibitory amino acids, on the other hand, are antagonized by the presence of stratum corneum. Professor Silva also continued her studies on the factors affecting variation in the dermatophytes. Interest at present centers around nine genetic clones of *T. mentagrophytes* which are now being compared from the standpoint of cultural morphology, antigenic make-up, and virulence for experimental animals.

Professor Steigleder completed a study of the protection afforded the skin surface by various ointments and so-called barrier creams. It was found that none of the preparations investigated could protect the esterase activity of the skin surface from aqueous solutions of soap and detergents under ordinary working conditions. With Dr. Wolfgang P. Raab, Professor Steigleder also investigated the activity of ribonuclease and deoxyribonuclease in normal and psoriatic skin. Apparently ribonuclease activity is increased in the parakeratotic horny layer of the psoriatic lesion, while deoxyribonuclease activity is decreased. However, it is still not clear that these changes are specific for psoriasis

and further studies will be needed in this regard.

Dr. David R. Weakley and Mrs. Julia M. Einbinder continued their studies on the production of acantholysis and intraepidermal vesiculation with dilute solutions of disodium cantharidin. Their findings suggest that this type of acantholysis is mediated by an effect of the chemical upon cutaneous oxidative carbohydrate metabolism. Although the histologic changes observed in this type of acantholysis closely resemble those seen in human cases of pemphigus, it now seems probable that they are caused by different mechanisms.

Employing both direct and indirect fluorescent antibody techniques, Dr. Walzer and Mrs. Einbinder have undertaken an investigation of possible auto-immune mechanisms in certain cutaneous diseases. In several of the diseases studied, discrete and intense fluorescent staining has been noted in sections of the skin lesions. However, it is still not clear whether these findings signify specific antigen-antibody reactions or whether they are the result of inflammatory changes in the tissues. With Mrs. Einbinder, Professor Nelson and Dr. Charles L. Fox, Jr., Assistant Professor of Surgery (Microbiology), studied further the effects of endotoxin on anaphylaxis. It was demonstrated that this material can either prevent or enhance the anaphylactic action in animals, depending upon the experimental conditions employed.

Staff Activities

A number of distinctions and honors came to members of the staff during 1961. Dr. George C. Andrews served as President of the American Dermatological Association and Professor Barker was elected President of the New York Dermatological Society. Professor Curth participated in the Fifth International Pigment Cell Conference held in New York in October.

Professor Domonkos addressed meetings of the North Carolina Dermatological Society and the Connecticut State Medical Society. Dr. E. William

Jewell was elected President of the Metropolitan Dermatological Society of New York, and Dr. Marie Karelitz-Karry accepted an invitation to assist in the establishment of a dermatological clinic at the Sri Aurobindo International Center of Education, Pondicherry, India. Professor Miller participated in the 12th Annual Symposium on Recent Advances in the Study of Venereal Diseases held in New York in April, and Professor Nelson was appointed to the editorial board of the American Medical Association Archives of Dermatology.

Professor Silva and Dr. Hazen assisted in the organization of an International Symposium on Fungi and Fungus Diseases, held in March under the auspices of the Section on Microbiology of the New York Academy of Medicine. The high point of this meeting was a dinner commemorating the three pioneer medical mycologists, all former members of this department, who established in the College of Physicians and Surgeons the first laboratory in North America for the study of fungi pathogenic to man. Those honored were Professor Hopkins, Professor Rhoda W. Benham and Dr. Bernard O. Dodge. Speakers at this dinner who commented on the careers of these outstanding mycologists and the history of medical mycology in New York include four members of this department, Dr. Arturo L. Carrion, and Professors Silva, Kesten, and Nelson.

Acknowledgment

The department gratefully acknowledges the support given its research program during 1961 by the following donors: Mr. William Black; Duke Laboratories, Inc.; Mr. and Mrs. Frank Greenwall; Dr. Elizabeth L. Hazen; Lehn and Fink Products Corp.; Mr. Walter J. Petschek and the Rogoco Foundation, Inc.; Col. Willard F. Rockwell and the Rockwell-Standard Corp.; Alfred P. Sloan Foundation; and the estate of an anonymous donor. Several agencies of the National Institutes of Health also contributed greatly to the support of research activities in this department.



Medicine

STANLEY E. BRADLEY

*Bard Professor and
Chairman of the Department
Director of Service*

The heartening success of the Medical Center Development Fund and the prospect of additional laboratory space within the immediately foreseeable future has stimulated the Department of Medicine to embark upon a long-range program of planning. Among the major desiderata are growth in the financial support of the department's work, growth in its staff potential and growth in its service, educational and scholarly capacity. Important advances have been made toward these goals during the past year. In all branches of the department, research has been maintained at a high level, closer coordination of teaching and inter-departmental activities has been achieved, and an enthusiastic re-evaluation and modernization of teaching methods has been in progress. Satisfaction with these successes has been tempered by sorrow for the loss of a valued and beloved colleague whose vision and effort have done much to fashion the department during more than thirty years.

Professor Joseph C. Turner died suddenly in his fifty-first year on February 28, 1961, in his most productive period and on the threshold of an origi-

nal and exciting venture in research. Professor Turner received his A.B. from Columbia College and his M.D. from the College of Physicians and Surgeons in 1933. His teaching in clinical pathology and on the wards will be long remembered. He was gifted with an extraordinary range and depth of intellectual power that endowed all he did with significance. His untimely death is a tragic loss to the Medical School and Presbyterian Hospital.

Professor Dickinson W. Richards has terminated, by retirement, an unusually distinguished and productive career as Director of the First Medical (Columbia University) Division at Bellevue Hospital to become Lambert Professor Emeritus of Medicine and Special Lecturer in the department and Director of the newly-created Cardiovascular Research Service. He created a Medical Service which, according to a recent survey by the Association of American Medical Colleges, stands among the top half-dozen in the nation in producing men who embark upon successful careers in academic medicine.

The tradition of critique and service he has es-

tablished at Bellevue will be carried forward under the stimulating leadership of Professor Charles A. Ragan, who has been named by the Faculty to succeed Professor Richards as Lambert Professor of Medicine and Director of the First Medical Division.

Honors

The Department of Medicine has been widely honored by numerous distinctions that have been conferred upon its members during the past year. Bard Professor Emeritus Robert F. Loeb has continued to serve as a Consultant of the Rockefeller Foundation, and he was elected a member of the Board of Overseers at Harvard University. He was Acting Regius Professor of Medicine during October at Oxford University, where he received an honorary degree of Sc.D. In addition he received the honorary degrees of Sc.D. from Columbia University and LL.D. from Amherst College. Professor Emeritus Franklin M. Hanger has been named President-Elect of the American College of Physicians. The American College of Chest Physicians honored Professor Emeritus Alvan L. Barach by awarding him the College medal for meritorious achievement in diseases of the chest. Professor Emeritus Dana W. Atchley served on the Planning Committee for the Teaching Institute of the Association of American Medical Colleges.

Professor Richards participated in a CIBA conference in London on pulmonary structure and function in July and served as honorary chairman of a meeting of the Royal Society of Medicine. He was elected President of the Harvey Society and President of the Association of American Physicians. Professor André Cournand gave a series of lectures at the International Course on Radiobiology at the University of Pisa in Italy in March and he was a guest lecturer at the University of Birmingham in England during July, receiving honorary degrees from both universities. Professor Cournand continues to serve in Paris as Private Consultant to the Delegat General (Office of the Prime Minister) in charge of scientific and technical research. The American Association for Cancer Research has chosen Professor Alfred Gellhorn as President-elect for the coming year.

Professor Forrest E. Kendall served as a member of the Executive Board of the Council on Arteriosclerosis of the American Heart Association. At a special symposium, Professor Karl Meyer received the first New York Medical College Award and Plaque, given "in recognition of distinguished achievement and service to science, medicine and humanity." Professor George A. Perera spent five

weeks in Australia as Pfizer Lecturer for 1961 under the auspices of the Australian Postgraduate Federation in Medicine, giving lectures in Adelaide, Brisbane, Canberra, Melbourne and Sydney, including the annual Lambie-Dew Oration at the University of Sydney. He was elected to the Boards of Trustees of Mary Imogene Bassett Hospital at Cooperstown and of the Columbia University Press. He continues to serve on the Board of the American Board of Internal Medicine.

Professor Ragan continues to serve as a member of the Council of the National Institute of Arthritis and Metabolic Diseases, as chairman of the Medical and Scientific Committee of the Arthritis and Rheumatism Foundation and on the Committee on Medical Research of the National Foundation. Professor John Taggart, Career Investigator of the American Heart Association, was elected Vice-President of the American Society for Clinical Investigation. Professor Stanley E. Bradley delivered the Niles Memorial Lecture for 1961 at Cornell University School of Medicine and the opening address at the Annual Meeting of the American College of Physicians. He attended conferences in Switzerland and France during the early fall.

Professor William Briscoc participated in a CIBA conference in London, and gave lectures at the Royal Free Hospital. Professor Alfred P. Fishman was appointed Consultant to the Office of the Special Assistant to President Kennedy for Science and Technology. He delivered the Dean's Lecture at Louisiana State University and served as Chairman of the New York Heart Association's Symposium on *The Plasma Membrane*. Professor Julia Jones was elected Vice-President of the New York Tuberculosis and Health Association. Professor John McClement was elected President of the New York Tuberculosis and Health Association. Professor Paul A. Marks has delivered lectures in Israel, France and England while on leave of absence to study at the Institut Pasteur in Paris under the direction of Professor Jacques Monod.

Professor M. Irené Ferrer was a Founding Member of the Association of University Cardiologists. Professor John Laragh lectured at the Royal Free Hospital in London in June. Professor Sidney C. Werner served as Chairman of the Arden House Conference on Thyrotropin sponsored by the Endocrine Study Section of the National Institutes of Health.

The Joseph Mather Smith Prize for Medical Research, Columbia University, was conferred upon Professor Nicholas P. Christy. Professor Elliott Osserman addressed the Mexican Society for the

Study of Cancer in Mexico City. Professor David Schachter gave the Mary Swartz Rose Memorial Lecture at the Annual Convention of the New York Dietetic Association. A Guggenheim Foundation Fellowship was conferred upon Professor Henry O. Wheeler to make it possible for him to carry out studies on electrolyte transport with Professor Hans Ussing at the Institute of Biological Chemistry in Copenhagen. Professors Charles Christian, Yale Enson, Henry O. Heinemann, Schachter, Gerard M. Turino and I. Bernard Weinstein were named Senior Investigators of the Health Research Council of New York City. Professors Donald F. Tapley and Schachter participated in the Fifth Biochemical Congress in Moscow.

Professor Henry Colcher was again invited to be Visiting Professor of Medicine at the University of Haiti for the month of July. With the completion of this service he received the highest civilian decoration of the Haitian Government, Grand Officier Honneur et Mérité. Professor Elliott Middleton, Jr., served as a Stoneburner Lecturer at the Medical College of Virginia.

Professors Daniel Rudman and Tapley and Dr. Gerald Phillips were honored by membership in the American Society for Clinical Investigation and Professor Wheeler became a member of the Society for Experimental Biology and Medicine. The Markle Foundation continues to support Professors Christian and Wheeler as Markle Scholars.

Clinical and Education Activities

During 1961 5,215 patients were admitted to the Medical Service for a stay that averaged 15.7 days. The daily census averaged 224.7, providing a variety of illness that assured an integrated view of medical problems for the house officers and medical students. Similarly, the patients making 24,427 visits to the Group Clinic and 36,465 visits in toto to the Medical Out-Patient Department presented a wide range of disorders for special study and for the benefit of students and Fellows. More than sixty-five Fellows, including men and women from the United States and fourteen other countries have brought new points of view to the department and a wholesome stimulus to self-criticism. Among those from abroad were: Dr. F. Alvarado, Spain; Drs. G. Berlyne, G. Cumming, L. Davidson, M. Dunnill, J. Hardwicke, and R. Williams, England; S. Angielski and A. Sicinski, Poland; A. Borkowski and A. Hendrikx, Belgium; Drs. J. Blum and J. Coelho, Argentina; E. Erenoglu, Turkey; R. Ferretti, Chile; C. Giunti, Italy; Drs. R. Lourenco and A. Luis, Portugal; K. Krishnamurthy, India; S. Hirano and K.

Takatsuki, Japan; Drs. E. Nash and R. Asherson, South Africa; K. Meckeler, Germany, and S. Zsoldos, Hungary. Support for Fellowship training was generously provided by the American Cancer Society, The American Heart Association, The Argentina National Board of Scientific and Technical Investigation, The Arthritis and Rheumatism Foundation, The John Polachek Foundation, The National Foundation, The New York Heart Association, The Rockefeller Foundation and The United States Public Health Service.

In addition, the department now has several training programs under the aegis of the United States Public Health Service through which specialized training may be made available to selected trainees. A hematology training program under Professor Marks will prepare two to three men each year as hematologists, with emphasis upon the acquisition of experience and skill in investigation. Similarly, the gastroenterology training program under Professors Bradley and Charles A. Flood is designed to afford ample experience with gastro-intestinal disease, including its methodology and pathology, but with stress upon the experimental approach.

Three major programs have received support from various sources that will foster and integrate investigation of metabolic, cardiovascular and hepatic disorders throughout the department. First, the Health Research Council of the City of New York activated a grant of \$250,000 to be used in 1961 and 1962 for the support of three research beds in the Metabolism Ward, a team of investigators, and necessary equipment. Added nursing and dietician support has enlarged the capacity of the Metabolic Ward which can now be kept open throughout the summer months as a research area. Professor Christy has been named responsible investigator for this project. A second grant which amounted to \$4,210,800 over a seven year period came from the Department of Health, Education and Welfare to be used in building and supporting a research center for the study of cardiovascular disease within the department. Professor Richards has assumed the responsibility of directing this new entity — The Cardiovascular Research Service — in association with Professors Fishman, David Seegal and Harry W. Fritts as Associate Directors. The grant provides immediately for ten beds in any of the branches of the department in the Presbyterian, Goldwater Memorial, and Delafield Hospitals. Organization of nursing, technical and professional staff is underway. Finally, The John A. Hartford Foundation, Inc., has made a gift of \$408,900 to the department for the study of hepatitis over a three year period, including the cost

of the care of patients and associated physiologic and microbiologic studies. These funds are not only an encouraging expression of confidence in the department's research potential but also an assurance that opportunity and facilities will be increasingly available to its members in the years ahead. In planning for most effective use of the current and projected laboratory space on completion of the Research Building, the department has embarked upon a long-range modernization program for improvement of the old areas. Money for this purpose is difficult to obtain, though essential for growth and efficiency. As a first step, a temperature controlled "cold laboratory" has been installed and the animal quarters renovated. A continuing program for further improvement is in progress.

Considerable thought and effort has also been put into an appraisal of teaching approaches during the past year by the Departmental Committee on Undergraduate Instruction under the chairmanship of Professor Atchley. The fourth year teaching in the Group Clinic has been greatly enriched by the enthusiastic work of Professors George Melcher and Albert R. Lamb, Chief of Clinic. Emphasis has been placed upon the more sophisticated aspects of practical medicine, particularly that final analytic appraisal of a case that makes possible the truly scientific and, at the same time, sympathetic understanding application of the objective data to a particular person that is so essential to intelligent therapeutic management. The need to concern himself with the social, economic and emotional problems of his patient and to work cooperatively with other physicians and para-medical workers introduces the student to his future role in the community. The Group Clinic concept which was developed in this Center continues to spread in the form of various types of "comprehensive care clinics."

The educational program in social service has continued under the direction of Professor Barbara Judkins. In June twelve social work students completed their field work training here. An additional unit of six students under a Field Work Instructor in collaboration with the New York School of Social Work has been made possible by a grant from the Office of Vocational Rehabilitation. Study of the contribution of the social worker has continued in Group Clinic. The findings thus far suggest that most of the patients referred for service are socially inadequate persons and, that earlier referrals to social service would more clearly define the needs of the patients and thus, in many instances, reduce excessive demands upon the physician's time.

Research Activities at the Medical Center

Professor Taggart, Dr. Stephan Angielski and Mrs. Helen Morrell have been engaged in studies on the metabolism of maleic acid, a compound which has been shown by others to block urinary acidification as well as the renal reabsorption of glucose, amino acids and inorganic phosphate. The pathway of its oxidation is now being elucidated by enzyme studies, which have demonstrated that maleic acid is first converted to the unnatural D-maleic acid, then to oxaloacetic acid, which in turn is oxidized to completion in the citric acid cycle. The enzymes involved are now being isolated and characterized. Dr. David Simpson in the same laboratory has undertaken a series of studies on the metabolic factors which regulate the renal excretion of citric acid.

Professor Perera's study of high blood pressure among the relatives of hypertensives, carried on in collaboration with the Department of Public Health and Administrative Medicine, is now in its fourth year. A definite familial prevalence has been found in a study of 200 matched family groups. Inasmuch as siblings of hypertensives have proven to be at higher risk, observations on a larger matched series will permit a comparison of offspring that may provide a test of the genetic role in etiology. In addition, Professor Perera has treated four patients suffering from "malignant" hypertension with the anti-thyroid drug — methimazole. During periods of from four months to more than a year, these patients remained free of hypertensive symptoms, showed complete clearing or no recurrence of retinopathy, and developed no further renal dysfunction. Improvement or the absence of progression occurred without a fall in blood pressure and began before clinical or laboratory evidence of hypothyroidism.

Professor Laragh has continued his studies of electrolyte metabolism and of hormones involved in hypertension and edema. Drs. Richard Ames, Marielena Angers, Carl Bentzel, Abraham Borkowski, Paul J. Cannon and Alfred Sicinski have been associated with him in this work. Dr. Jay Meltzer has also participated in the activities of the laboratory on a part-time basis. The findings of oversecretion of the sodium-retaining hormone, aldosterone, in malignant hypertension, has resulted in the discovery that angiotensin, a pressor substance of renal origin, stimulates adrenal secretion of aldosterone, leading to the suggestion that there is a renal-adrenal mechanism for the control of sodium balance which is deranged in this disorder. Now studies have been designed to investigate whether such a mechanism operates in other forms of physiologic and patho-

logic hyper-aldosteronism. The effect of angiotensin infusions on blood pressure, electrolyte balance, renal function and aldosterone secretion has been investigated in normal subjects and in patients with cirrhosis and ascites. Angiotensin caused salt retention in normal subjects, whereas other pressure agents increased sodium output. In patients with cirrhosis, angiotensin was found to produce natriuresis of strikingly greater magnitude than norepinephrine. Renal clearances have indicated that angiotensin depresses the renal tubular reabsorption of sodium chloride, suggesting that this substance may play an important intrarenal role in regulating sodium excretion in addition to its action to stimulate adrenal aldosterone output. Since tachyphylaxis to the pressor effects of angiotensin infusions was noted, it may be inferred that angiotensin circulates in increased amounts in various states associated with secondary aldosteronism, such as cirrhosis, heart failure and nephrosis. The results obtained to date are in keeping with the view that the release of an aldosterone-stimulating hormone by the kidney is determined by some critical change in the intrarenal circulation.

Studies of various drugs in edema and hypertension have also continued. Promising results have been obtained with a pteridine natriuretic agent which blocks potassium excretion. The compound may be especially useful combined with thiazide diuretics. Alpha-methyl DOPA has been found useful in treatment of advanced hypertension. This compound, originally studied by the late Professor Marcel Goldenberg, does not interfere with norepinephrine production as had been thought. The agent is well tolerated, and its blood pressure lowering action appears to occur with relatively little adverse effect on renal function.

Professor Bradley has continued studies of renal functional adjustments in man and animals, in collaboration with Drs. Jaime Coelho, Robert Whitlock, and John Hardwicke. An effort has been made to define the extent to which the nephron population is affected by intense vasoconstriction induced by orthostasis in man and by hemorrhage to hypotensive levels in the dog. The data indicate that blood flow decreases throughout the kidney with relatively uniform reduction in nephron function. It is possible that more extreme states will induce population changes but to date no evidence of such an effect has been adduced. Dr. Hardwicke is measuring clearances of the various protein moieties by immunochemical techniques in dogs and man with proteinuria in order to define more clearly the character of altered permeability.

The Cardiorespiratory Laboratory continues to operate under the direction of Professor Fishman with the support of Professor Turino and Drs. Edward Bergofsky, Roberta M. Goldring, Lindsay Davidson, David Lehr, Eugene Morkin, Ruy Lourenco, George Lord, Ricardo Ferretti and O. Robert Levine. Dr. John Wood also participates on a part-time basis. The studies of the laboratory are concerned mainly with the regulation of the pulmonary circulation, the histological determinants of the mechanical behavior of the lungs, the tracheobronchial system and the pulmonary vascular tree, and the gas tensions of tissues. Acute hypoxia has been shown to be a potent stimulus for pulmonary vasoconstriction and for adapting alveolar perfusion to alveolar ventilation. Studies were completed showing that neither catecholamines nor intrapulmonary liberation of lactic acid are involved in the pressor response to acute hypoxia. Professor Turino has worked with Dr. Goldring and Dr. Dorothy Andersen, Professor of Pathology (Pediatrics), Assistant Attending Pediatrician, and Attending Pathologist, in an analysis of the patho-physiological bases for pulmonary hypertension in patients with cystic fibrosis of the pancreas. He has made further progress in subjecting the lungs of living rabbits to the enzymatic removal of particular constituents, i.e., collagen or elastic tissue, for studies of the effect upon compliance and the work of breathing, the static pressure-volume characteristics of the tracheobronchial tree and lungs and the chemical composition of the trachea and lungs. Using oxygen polarography and the carbon dioxide infra-red analyzer the gaseous composition of lymph in the dog has been determined by Dr. Bergofsky. The results indicate that lymph from various sites is exceedingly low in oxygen content. A joint project has been undertaken by the Laboratory with the Department of Fluid Mechanics at Columbia University to explore some biophysical properties of the pulmonary circulation.

Under the direction of Professors Ragan and Christian, the Edward Daniels Faulkner Arthritis Clinic has been concerned with a number of related projects. Professor Christian has made pathologic studies of renal glomerular lesions in animals injected with immune complexes. The lesions produced seem to fill the histologic criteria of amyloidosis. In addition he has continued his studies of a serum factor resembling the human rheumatoid factor, that appears in the blood of rabbits following hyperimmunization with bacterial antigens. The possibility that a comparable immunization, by some unrecognized antigen, may occur in rheumatoid

subjects is being explored. An attempt has been made to characterize the cold-precipitable proteins that separate from the sera of some patients with systemic lupus erythematosus and rheumatoid arthritis. Preliminary studies suggest that these precipitates may result from immunologic reaction between antigens and their antibodies in the circulation. Finally, Dr. Floyd Green is studying gamma globulin fragments in the urine of normal subjects and patients with proved systemic lupus erythematosus.

The group working with Professor Meyer has continued studies of the chemical structure and biological functions of mucopolysaccharides. The main structure of keratosulfate has been determined by Drs. Shigaru Hirano, Philip Hoffman and Professor Meyer after isolation and characterization of the methylated monosaccharide residues. In collaboration with Dr. Eugene Smith, work is proceeding on a bacterial enzyme which hydrolyses keratosulfate into oligosaccharide fractions. Drs. Hirano and Hoffman have further proven the configuration of the hexosaminidic bond in hyaluronic acid and confirmed the structure previously hypothesized from knowledge of the structure of the unsaturated disaccharide produced by bacterial hyaluronidases. Dr. Hoffman and Miss Phyllis Sampson have continued studies on the structure of heparitin sulfate and of heparin. Dr. John Lindenbaum has isolated and characterized mucopolysaccharides of both resting and calcifying cartilage of calf scapula, a tissue well-suited to the study of calcification. Dr. David Kaplan and Professor Meyer have studied the excretion of various sulfated mucopolysaccharides in dog and man. Intradermal injection of sulfated polysaccharides, especially heparitin sulfate, was shown to stimulate hair growth in the rabbit.

Professors William B. Sherman and Middleton have continued experiments on the formation and chemical nature of slow-reacting-substances (SRS), substances with the properties of an acidic lipid formed in anaphylactically sensitized guinea pig (and human) lung on reaction with antigen. A purification procedure based on solubility characteristics at different pH values has been worked out with Dr. Phillips. Such purified preparations, after hydrolysis, reveal several fatty acids by gas chromatography but no gross differences from controls. Further experiments are underway to determine the origin of the fatty acids, i.e., whether free or in the form of phospholipid or phosphotidic acids. Histamine release and SRS formation in sensitized guinea pig lung appears to be reduced in the presence of nicotinamide, a potent inhibitor of diphosphopyridine

nucleotidase (DPNase). In collaboration with Dr. Anima Devi, a decrease in lung content of DPN has been observed following reaction with antigen, suggesting that the DPN-DPNase system may be involved in anaphylaxis.

Professor Marks has been concerned with the biochemical changes associated with the differentiation and aging of hematopoietic cells, with particular emphasis on the red cell. Studies in his laboratory have elucidated various aspects of the enzymatic changes associated with red cell aging *in vivo* and the alterations in energy metabolism and lipid synthesis which occurs as these cells mature. These studies have provided evidence that the life span of the erythrocyte under normal conditions may, in part at least, be limited by the progressive and selective decline in the activity of certain enzymes, in particular glucose-6-phosphate dehydrogenase and 3-phosphoglyceric aldehyde dehydrogenase. Dr. Richard Rifkin has collaborated with Dr. Councilman Morgan, Professor of Microbiology and Assistant Attending Physician, in the application of electron microscopy to problems concerned with erythrocyte morphology and function. Techniques devised for the study of viral morphogenesis and for the localization of intracellular viral antigens have been applied to problems in hematology. These include a study of the distribution of surface and internal blood cell antigens as well as electron microscopic observation on the cytopathology of Chediak's abnormality of leucocytes. Professor Robert Kritzer, with Drs. Phillips and John Lindenbaum, has conducted studies of a case of genetically determined disease manifest by hepatosplenomegaly, pancytopenia, partial albinism and neuropathy (Chediak-Steinbrück-Higashi) have disclosed abnormalities in serum alpha lipoproteins, triglycerides, and various phospholipids. Studies in progress indicate these findings are also present in heterozygote kin. Dr. Helen Anderson has studied the composition of the red cell membrane, placing particular emphasis on a correlative study of the phospholipid and fatty acid composition of erythrocytes of normal individuals and patients with various anemias. In addition, she has initiated a study of the rate of incorporation of radiophosphorus into the various classes of phosphatides in the stroma of red cells from patients receiving the isotope therapeutically.

Professor Schachter has continued investigation on the cellular transport mechanisms which regulate intestinal absorption. With Dr. James G. Manis, an active transport mechanism for the intestinal absorption of iron was described and its features studied *in vitro* and *in vivo*. The active absorption is adap-

tive, increasing to meet the requirements of pregnancy or enhanced erythropoiesis. The intestinal transport increases when the diet is deficient in iron and decreases when oral intake is excessive. The biochemical intermediates in the transport process are now under further investigation. The hormonal regulation of the intestinal transport of calcium is under study with Dr. James Finkelstein. Hypophysectomy greatly decreases the active transport of calcium, and the mechanism can be restored by the administration of purified growth hormones of the anterior pituitary. Growth hormone is also required for the intestinal transport of iron but the absorption of hexoses or amino acid are little influenced.

Professor Wheeler has worked with Dr. Rudolf Preisig in investigations of biliary physiology in dogs fitted with Thomas fistula. They have been able to prove that bile flow is dependent upon bile acid availability and that secretin activity is not blocked by a cholinergic blocker — Piptal. Drs. Preisig and Roger Williams have embarked upon an intensive study of Bromsulfalein transfer mechanism in patients with hepatitis. Studies of the variance of the parenchymal cellular storage function in normal subjects have also been undertaken. A clinical evaluation of the course of hepatitis has been developed in collaboration with Professors Bradley and Yale Kneeland, Jr., under the hepatitis project. Mrs. Katherine J. Baker has carried out an intensive investigation of the protein-binding properties of Bronsulfalein.

During the past year, studies of esophageal motility were continued under the direction of Professor Flood in the Gastrointestinal Clinic. Various methods of study are being used to analyze the different mechanisms whereby propulsive peristalsis can be disrupted. Studies of pain mechanisms of esophageal and cardiac origin and their interrelationship are being continued with Drs. James Mathers and Sidney Fink. Long term studies of ulcerative colitis are being pursued in the Ulcerative Colitis Clinic. Professors Flood and Michael Lepore, with Professor George Daniels and others of the Psychoanalytic Clinic, are completing an analysis of long-term effects of psychotherapy on a group of approximately sixty patients with this disease as compared with a control group who did not receive psychotherapy. Professor Flood also completed investigation of factors which influence prognosis in cancer of the stomach in collaboration with Dr. Josephine Wells, Associate Professor of Radiology and Attending Radiologist, and Dr. Harold D. Harvey, Professor Emeritus of Clinical Surgery.

Studies of an abnormal adrenocorticotropin in

blood of patients with Cushing's syndrome were continued by Professor Christy, in collaboration with Dr. William D. Drucker. Adrenal weight-maintaining activity is detectable in blood of patients with adrenocortical hyperplasia but not with adrenal tumor. The activity disappears following pituitary x-radiation associated with clinical remission. These and earlier data indicate that the pituitary plays an essential role in maintaining the hyperadrenal state. With Dr. Drucker, a biological assay of plasma was used in an attempt to appraise secretory activity of the pituitary tumor in acromegaly. Preliminary data indicate that there is a reasonably good temporal correlation of clinically active phases of the disease and positive assays which become negative after x-radiation of the sella and clinical remission. Studies of the metabolism of corticosteroids in acquired or congenital hepatic disease have been continued in collaboration with Drs. Drucker and Abraham Borkowski. Results suggests the utilization in some instances of alternative metabolic pathways. With Dr. Joyce Shaver, studies of sodium and water metabolism in patients receiving estrogen were continued in an effort to determine the presence or absence of adrenal cortical participation in the edema that often accompanies the injection of estrogenic hormones. With Professor Laragh, the hypokaliemic alkalosis of Cushing's syndrome was examined. The electrolyte abnormality appears to be the consequence of grossly excessive secretion of cortisol, not of aldosterone. In hypokalemic patients, plasma and urinary concentration of cortisol was higher than in patients with Cushing's syndrome and normal plasma electrolytes; secretory rate of aldosterone was normal. With Dr. Frederick G. Hofmann, Associate Professor of Pharmacology, further study of the biosynthetic capacity of mouse adrenal tumors was carried out. A constant finding is the reduced enzymic capacity of neoplastic adrenal tissue to synthesize certain steroids, as compared to normal adrenal.

Dr. Donald Holub is studying the incorporation of various isotopically-labelled amino acids into adrenocorticotrophic hormones (ACTH) by pituitary tissue using an *in vitro* incubation technique. The rate of incorporation can be used as a parameter of ACTH synthesis, and the influence of various pharmacologic and hormonal agents on the rate of ACTH synthesis is currently being investigated. The mechanisms underlying the coincidence of non-endocrine malignancies with Cushing's syndrome have been studied in several patients. An ACTH-like substance has been isolated from neoplastic tissue in one patient, suggesting that extra-pituitary

tissue may occasionally be capable of synthesizing ACTH-like polypeptides, thereby causing intensive stimulation of the adrenal cortex and clinical hyperadrenalism. The enzymatic deficiencies in the uncommon "hypertensive" variant of congenital adrenal hyperplasia have been studied. Although an apparently complete absence of the 11-beta-hydroxylating systems with respect to glucocorticoid hormones was discovered in one such patient, the ability to form appreciable quantities of aldosterone was retained, implying that a functional zonation of hydroxylating enzyme systems may exist within the adrenal cortex. A series of studies of adrenal hormonal biosynthesis was undertaken in association with Dr. Joseph Barlow. Substances which inhibit (such as Su4885) or stimulate corticoid synthesis (such as ACTH, cyclic AMP and TPNH) were tested alone and together, and the results indicated that more than one biosynthetic route to aldosterone formation exists in the rat adrenal cortex. Moreover, evidence was obtained suggesting that Su4885 inhibited 11-beta-hydroxylation by interfering with TPNH generation or utilization.

Professor Werner has found that the "abnormal activator" in the blood of patients with Graves' disease is a thyrotropin-like material with an action resembling, but not identical with, that of pituitary thyrotropin, which can be neutralized by an anti-serum prepared against bovine pituitary thyrotropin. Thus, "activator" could be thyrotropin, although the presence of another substance would be required to account for the prolonged action observed. The possibility exists that "activator" is not identical with thyrotropin, but has enough features in common with thyrotropin to permit neutralization. Studies are being pursued in an effort to assay thyrotropin and "activator" in serum by immunological means. With Drs. Eugene Volpert and Raul Grinberg, Professor Werner has found that I^{131} -labelled thyroxine is uniquely metabolized by thyrotropic mouse pituitary tumors with the formation of labelled triiodothyronine. This response does not occur in mouse pituitary adreno-tropic tumors, control tissues or non-pituitary tumors, suggesting the possibility that the thyrotropic cell may be separate and that formation of triiodothyronine may have to do with the action of thyroxine in suppressing thyrotropin secretion by this cell. In collaboration with Dr. A. Gitelsohn of the New York State Board of Health and Dr. A. R. Brill of Johns Hopkins University, the incidence of leucemia after I^{131} therapy of hyperthyroidism has been investigated by sending questionnaires to major clinics in the United States. A marked deviation from the expected incidence has

been found and, in consequence, a collaborative effort with the Radiological Division of the National Institutes of Health to follow patients treated with I^{131} since 1946 has been set up on a national scale. Further progress has been made in establishing the belief that the "stable iodotyrosines" first noted by this laboratory in normal serum are truly iodotyrosines. In collaboration with Professor C. Keller-shohn of the Hospital D'Orsay, Paris, and with Dr. Ila Radichevich and Mr. Vasudeo V. Row, neutron activation has been used to show that the compounds in question do in fact contain iodine in amounts consistent with the iodoaminoacids in question.

Professor Tapley has continued his studies on the active transport of amino acids, thyroxine analogues, and steroids by rat intestine. In collaboration with Thomas E. Deuel, a fourth year student, evidence was obtained suggesting that only one transport system is responsible for the transport of all amino acids. Evidence has been obtained which indicates that the enzyme N-glucuronyl transferase may be involved in this process. A study of the properties of this enzyme has been undertaken in collaboration with Leonard Leventer of the second year class. In conjunction with Dr. Irwin Arias of the Albert Einstein College of Medicine, a study has been made of the ability of the Gunn rat (which has a deficiency of glucuronyl transferase) to transport amino acids, thyroxine analogues and steroids. Evidence has been obtained that these animals, having a decreased ability to form ethereal and ester glucuronides, do not have a deficiency of N-glucuronyl transferase. In collaboration with Mary Kreek of the fourth year class and Frederick Guggenheim of the Class of 1961, the transport of testosterone by rat intestine has been shown to involve the formation of a glucuronide conjugate, as well as of various steroid metabolic products. A study of the transport of estradiol by Frank Smith, of the fourth year class, has likewise resulted in the demonstration of a glucuronide conjugate. A study of the transport of adrenal cortical steroids has been undertaken in collaboration with Dr. Theodore Stahl.

In the Thyroid Clinic, Dr. Robert M. Day, Assistant Professor of Clinical Ophthalmology and Associate Attending Ophthalmologist, has collaborated with Professor Henry Aranow in studies of the ophthalmopathy associated with Graves' Disease. An additional year of experience supports the conclusion that management with antithyroid drugs according to a regimen which places primary emphasis on the eye findings is less hazardous.

Professor Kermit L. Pines has evaluated modifications of the method for determining tubular reab-

sorption of phosphate in the diagnosis of primary hyperparathyroidism during the past year. High carbohydrate and low saturated-fat diets have also been appraised as a means of management of ambulatory diabetic patients. Dr. Hans Neuberg has continued to review the charts of diabetic patients who have been followed here at Presbyterian Hospital for ten years or more in an attempt to discover whether the composition of the diet, with regard to distribution of carbohydrates and fat, has any bearing on the incidence of the various complications of diabetes mellitus.

At Bellevue Hospital

Professor Ragan is setting up a program for coordinating work on rheumatoid arthritis in the Faulkner Clinic with an in-patient study of the effects of physical exercise upon nitrogen and mineral balances in such patients at Bellevue. He has been successful in obtaining the support of the Health Research Council of New York City for establishing an intensive care unit for this purpose. Compilation of data drawn from a retrospective study of the clinical features of rheumatoid arthritis has been completed and analysis indicates that prognostic indices are few, the only reliable one found thus far appears to be the rheumatoid factor.

The Cardiopulmonary Laboratory, under the direction of Professor Cournand, is staffed by Professors Briscoe, Ferrer, Fritts and Réjane Harvey, and the following post-graduate and research trainees: Drs. M. Lewis, E. Nash, J. Walker, C. Giuntini, M. Dunnill, G. Cumming, A. Luis, A. Okinaka and P. Caldwell. Dr. Domingo Gomez, Lecturer, has contributed importantly to the thought of the Laboratory in the past year. He has developed a biophysicomathematical formulation of the problems of 1) air flow, linear velocity, gas diffusion, and their interplay in the respiratory system; 2) passage of gases across the alveolo-capillary membrane, and 3) distribution of ventilation throughout the lung. Professor Briscoe has continued his studies of the alveolar ventilation/capillary perfusion relationships in chronic obstructive diseases of the lungs, using various methods developed during preceding years. More recently, in collaboration with Dr. Cumming, he has applied to the analysis of nitrogen washout curves the physico-mathematical concepts established by Dr. Gomez. Dr. Ewald Weibel, collaborating with Dr. Gomez, has developed several methods for quantitative morphological studies of air-ways, respiratory units, and capillaries. Dr. Dunnill is presently extending these quantitative morphological studies to emphysematous lungs. Professor Harvey,

in collaboration with Drs. Lewis and Guintini, has worked on the measurement of right ventricular diastolic volumes in changing hemodynamic states. The substitution of Zenon¹³³ — a high gamma-emitting tracer, for Kr⁸⁵ is underway. Professors Ferrer and Harvey are collaborating with Professor Bradley and his group in studies of the effects of Digoxin and of nitrites upon the splanchnic blood flow and volume in patients with cardiac failure. In addition, and in collaboration with Dr. Enson, they are concluding their work on the effects of hypertonic bicarbonate solutes and of THAM upon the pulmonary circulation in patients with chronic obstructive diseases of the lung. Dr. Enson has continued an investigation of a *in vivo* oximeter developed by the American Optical Company. Direct recording of dye dilution curves within the pulmonary or the brachial artery has been achieved. Professor Fritts has concentrated upon an evaluation of the oxygen consumption of tissues within the human lungs. Using an analysis based on the Fick principle, he has found that the oxygen consumed by normal lungs is within the error of the measuring technique, whereas patients with far-advanced active pulmonary tuberculosis almost always show a measurable pulmonary oxygen consumption. The lungs account for a sizeable fraction of the total oxygen uptake, about ten per cent on the average. He is also investigating the feasibility of using infusions of Kr⁸⁵ to estimate the output of the right ventricle rather than employing rapid injections of T-1824 dye as had been done in the past.

Professors McClement, Jones and Marvin Kuschner are continuing to study the daily quantitative changes in the number of tubercle bacilli in the sputum and secretions of patients under chemotherapeutic treatment for tuberculosis. To date their observations suggest that in patients initially treated with regimens containing isoniazid there is a rapid fall in the number of organisms excreted in the first few weeks, and then a period of persistence of the organisms before they disappear. Daily enumeration of tubercle bacilli is providing a useful index to the effectiveness of chemotherapeutic regimens in patients with organisms that are resistant to the more commonly used drugs. Dr. David Simpson is continuing an appraisal of hypersensitivity to para-aminosalicylic acid (PAS) and other drugs used in the treatment of tuberculosis. He has recently observed that the SGOT level may be elevated reversibly in patients under treatment with PAS when there is no other clinical evidence of hypersensitivity. In a few patients liver biopsy has shown parenchymal changes. Dr. Simpson has also evolved a rapid procedure for desensitizing patients to PAS and other

drugs by the concomitant use of cortisone. Professor Jones and Dr. Robert Henderson are concluding and tabulating their long-term study of the effect of chemotherapy on the course of various forms of extrapulmonary tuberculosis.

With Dr. Anne Davis and Dr. Simpson, Professors Harvey and McClement have organized a coordinated study of emphysema and bronchitis. Serial clinical and physiologic observations on between 150 and 200 patients are being collected. A special clinic in the Out-Patient Department has been organized for this group, and in the hospital they are treated and studied in a single unit. Drs. Anne Briscoe and William Loring have continued their observations on the lung, and have made observations on the collagen, elastin, lipid, hemoglobin, calcium and iron content of emphysematous lungs. They have found that elastic and hemoglobin are decreased, carbohydrate and iron are increased, and lipid, collagen and calcium are similar when emphysematous lungs are compared with normal.

At Delafield Hospital

Professor Alfred Gellhorn has continued his studies on lipid metabolism, placing particular emphasis upon the changes which occur with aging. With Dr. William Benjamin, he has found that there is a progressive decrease in fatty acid biosynthesis in adipose tissue, liver and aorta with aging. The results have indicated that the *de novo* synthesis of unsaturated fatty acids declines in adipose tissue with aging. In a cooperative investigation with Professor Marks, lipid biosynthesis by human leucocyte, platelets and erythrocytes has been investigated in normal subjects and patients with a variety of disease states, e.g. acute and chronic leukemias. The data are in accord with the view that active synthesis of triglycerides and phospholipids, but not cholesterol esters, proceeds in normal leucocytes and platelets, but not in mature red cells. Leucocytes of patients with chronic myelogenous leukemia and chronic lymphatic leukemia differ from each other and from normal cells in rates of lipid synthesis and types of lipids formed. Experiments are in progress to determine whether these changes in lipid metabolism are characteristic of aging in human leucocytes and in the endothelium of blood vessels. Ultimately it is hoped that changes in lipid chemistry and lipid metabolism of the cell can be related to changes in specific cellular functions.

Professor Osserman has continued to devote his efforts to coordinated clinical biochemical and immunochemical studies of the plasmocytic dyscrasias, plasma cell myeloma, primary macroglobulinemia,

and the as-yet unclassified forms of so-called monoclonal gammopathy. In cooperation with Dr. Norman Talal and Dr. Kiyoshi Takatsuki, significant progress has been made in the elucidation of the role of specific Bence-Jones proteins in the pathogenesis of the proteinaceous tissue infiltrates, so-called paramyloid deposits, which develop in approximately ten percent of cases of overt or occult plasma cell myeloma. The evidence to date supports the hypothesis that these tissue infiltrates are insoluble conjugates of specific Bence-Jones proteins and tissue proteins and/or polysaccharides. With Peter Kohler of the Class of 1961, serum protein with broad-spectrum anti-bacterial activity has been identified as the unsaturated form of the iron-binding globulin (transferrin, siderophilin). An extremely sensitive technique for demonstrating this activity was developed.

Professor Heinemann, in association with Dr. Cemil Emirgil, Dr. Stephen Zsoldos, and Mr. Khosrow Nasr, a fourth year medical student, has found that patients with hypercalcemia of various origins may have either metabolic alkalosis, impaired ammonia excretion by the kidneys, or both. These two defects are not related. Determination of pulmonary functions has established that lymphangitic spread of neoplastic disease leads to alveolar-capillary block while multiple hematogenic metastases lead to increased venous admixture. Both entities are accompanied by reduced elasticity of the lung parenchyma. Having found that the vasculature of the lung is capable of lipolytic activity, Professor Heinemann and his associates have attempted to determine whether the lung can also synthesize lipids and they have succeeded in showing that *in vitro* perfusion of the isolated rabbit lung with Ringer's solution containing albumin and C¹⁴-labelled acetate leads to the formation of both free fatty acid and triglycerides. It has also been found that free fatty acids may be released by the isolated rabbit aorta by this procedure. Finally, perfusion of the isolated rabbit lung with serotonin has demonstrated that conversion to 5-hydroxyindolacetic acid is not the major pathway of inactivation by the lung.

Under the direction of Professor George Hyman, further investigation was carried out in the field of clinical cancer chemotherapy in collaboration with the Medical Service and with the Departments of Surgery and Radiotherapy of the Francis Delafield Hospital and the Presbyterian Hospital. Studies of a total of 105 patients with inoperable cancer who received 5-Fluorouracil indicated that only limited objective improvement is obtained in patients with inoperable carcinoma of the colon, breast and

stomach. Methotrexate (amethopterin) used separately and in combination with radiotherapy was studied in four patients with malignant hemangio-endothelioma, a rare perivascular malignancy, with significant tumor regression, the combination seeming to yield the best results. The hematology research laboratory at Delafield Hospital continues its major interest in the problem of causation and management of retinoblastoma. This work is being done in collaboration with Dr. Algernon B. Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist; Dr. Robert M. Ellsworth, Instructor in Ophthalmology and Assistant Ophthalmologist; Dr. Patricia Tretter, Instructor in Radiology and Assistant Radiologist; and Dr. Carl R. Feind, Instructor in Surgery and Assistant Attending Surgeon.

Dr. Frederick A. Klipstein has investigated the absorption of folic acid and B₁₂ (using tritium-labelled folic acid and Co⁶⁰-labelled vitamin B₁₂), glucose tolerance, serum carotene and iron concentrations, I¹³¹ triolein absorption, and jejunal biopsies in patients with neoplasms of the small bowel. Professor Philip Feigelson has continued his studies of the mechanism of substrate induction of tryptophan pyrrolase which show a direct correlation between hematin activation and induction of pyrrolase, supporting the hypothesis that the regulation of the level of the protein moiety of tryptophan pyrrolase *in vivo* may be mediated by the concentration of its hematin coenzyme. The mechanism by which elevation of the level of tryptophan in the liver brings about the saturation of tryptophan pyrrolase with respect to its heme activator has also been investigated. The induction of tryptophan pyrrolase by allylisopropylacetamide was found to be significantly greater in intact than in adrenalectomized rats, indicating that this agent stimulates adrenal cortical secretion as well as the increased saturation of the enzyme by hematin.

Professor Erich Hirschberg obtained data with Mrs. Martha Osnos on the glutamic dehydrogenase activity of mouse liver and brain and several mouse tumors. The enzyme exists in at least two forms, which differ in the tightness of binding to cell particulate matter and also in susceptibility to inhibitors. The total activity of mouse liver is appreciably higher than that of other normal tissues or experimental neoplasma, but no significant differences in the pattern of microheterogeneity are apparent. With Mrs. Shirley Brindle and Miss Gloria Sementc, he has investigated the sublines of mice with leukemia resistant to Miracil D, finding that the leukemic cells resistant to this sulfur-containing heterocyclic

compound are cross-resistant to thioguanine, and to cytoxan, but not to other antipurines, folic acid antagonists, or other compounds.

Dr. John Ulmann has studied seven patients with documented hyperthyroidism and tumors of the reticuloendothelial system, to assess the relationship of prolonged hyperthyroidism to the production of lymphomas in man. He has also carried out a study of the effect of quinacrine on neoplastic effusion as well as a clinical evaluation of cytophosphamide.

Dr. I. Bernard Weinstein has devoted himself to studies of biochemical genetics, including procedures for the selection and growth of bacterial mutants, the fractionation of bacterial and animal cells into their particulate components by differential centrifugation and the purification of specific protein and nucleic acid fractions by column chromatography and gradient density centrifugation. In collaboration with Professor Osseman, studies on the subcellular synthesis of gamma globulin protein, employing a transplantable plasma cell tumor of mice, have been undertaken. A cell-free system has been developed which incorporates C¹⁴-amino acids into protein. This incorporation is dependent upon ATP and inhibited by puromycin. Extracts are inactivated by RNAase but not DNAase. Further fractionation of the system and characterization of the labeled product are now in progress.

At Goldwater Memorial Hospital

Professors Kendall, Liese Abell, and Erwin Mosbach report that the oral administration of 30 mg/kg body weight of 17- α -methyltestosterone to Wistar rats maintained on low cholesterol diets produces a forty-six percent reduction of serum total cholesterol concentration without altering the ratio between the cholesterol content of the high (a) and low (B) density lipoprotein fractions. In rats maintained on a one percent cholesterol diet, however, the hypocholesteremic action of methyltestosterone at a dosage of 60 mg/kg, manifests itself largely in a lowering of the cholesterol content of the α -lipoprotein fraction. Professor Mosbach and Dr. Margaret Bevans have continued their investigations on the effect of hormones on dihydrocholesterol-induced cholecystitis and cholelithiasis in the rabbit. Oral administration of the synthetic androgen, 17- α -methyltestosterone, proved to be more effective than parenteral administration in reducing the severity of the cholecystitis and cholelithiasis.

During the past year, Professor Rudman has continued investigations on the relation of the pituitary gland to the mobilization of lipid from adipose tissue. A pituitary protein ("Fraction H") which stim-

ulates the mobilization of lipid from adipose tissue and which is different from the recognized pituitary hormones has been isolated from hog and sheep pituitaries. Evidence for a minor difference in the chemical structure of the hog and sheep factors has been obtained. The activity of each of these two substances in mobilizing lipid varies in different animal species. The pattern of species specificity for hog Fraction H and for sheep Fraction H has been delineated and studies of the mechanism of the resistance of certain species to the action of these lipid-mobilizing pituitary proteins are in progress. The physiology of the mobilization of lipid from adipose tissue has been investigated, employing Fraction H as a means of experimentally inducing the rapid mobilization of lipid. Accumulation of the mobilized lipid in the kidney and liver of several different animal species has been observed.

Professor Robert Hirsch, with Miss Rosemary Ireland and Mrs. Ruth Skraly, has investigated the origin and fate of plasma free fatty acids and triglycerides mobilized into the blood stream of rabbits by two adipokinetic substances from the pituitary gland. In the intact animal both hog Fraction H and ACTH stimulate an outpouring of free fatty acids from the fat depots. The fatty acids are quickly removed from the blood as it passes through the liver and the kidney, and shortly thereafter appreciable quantities of fat can be demonstrated by histologic techniques within the hepatic cord cells and the cells of the renal proximal convoluted tubules.

In collaboration with Professor Rudman, Professor Arthur Wertheim and Dr. Seraphine Bern and Dr. Juan Edreira assisted in the purification of the lipid mobilizing component of the pituitary gland. Sufficient purity has been achieved so that the active principle is concentrated in a protein that moves as a single band during paper electrophoresis. Professor Wertheim, with Drs. Bern and Edreira, finds in man that priming diets affect the curves of fat tolerance tests in the following manner: challenge tests after low fat diets (20 gm fat) result in a higher and more prolonged lipemia than do tests after diets containing 70-100 gm of fat. Professor Alfred Steiner and Dr. Elliott Howard have continued their studies on the effect of antibiotics on the serum lipids of patients with coronary atherosclerosis. Oral neomycin in dosages of 2 gm daily has been found to reduce the level of serum cholesterol (average of twenty-two percent) in all patients treated for period of at least one year. Oral kanamycin and aureomycin have a similar but less marked and less consistent effect. It has been demonstrated by the formula diet technique that the addition of crystalline chole-

sterol to the diet results in a prompt increase in the level of serum cholesterol in man, provided that the cholesterol is fed in a manner which facilitates its absorption from the gastrointestinal tract.

Dr. Henry Lax and Professor Arthur Feinberg are continuing their long-term studies of the arterial pulse wave. Their series of diabetic children, eleven to twenty years of age, has been increased to 198 subjects, sixty-four percent of whom show abnormal arterial pulse waves in the absence of other detectable clinical stigmata of vascular disease. In contrast, only eight percent of 275 non-diabetic subjects of approximately the same age and sex exhibit abnormal pulse waves. Professor Arthur Patek, with Dr. Esat Erenoglu and Mrs. Nancy deFritsch, has extended earlier studies concerning the role of alcohol in Laennec's cirrhosis. The findings to date suggest that a daily intake of 12 ounces of fifty percent alcohol does not influence the usual liver function tests in patients with Laennec's cirrhosis who are adequately fed.

Professor Hylan Bickerman and Drs. Paulo Marquez and Eduardo Pons, Jr., are applying the heated aerosol technique to obtain sputum specimens from patients with abnormal chest x-rays. These studies are being performed with the cooperation of Professor M. Henry Williams, Jr., of the Albert Einstein College of Medicine.

Acknowledgments

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Microbiology

HARRY M. ROSE

Borne Professor and Chairman of the Department

Attending Microbiologist and Associate Attending Physician

It is satisfying to report that Dr. Herbert Rosenkranz was appointed Assistant Professor of Microbiology, effective September 1, 1961. Professor Rosenkranz is interested in biologic phenomena from the biochemist's point of view, with particular reference to the structure and function of viruses. Dr. Charles L. Fox, Jr. was appointed Assistant Professor of Microbiology, assigned to the Department of Surgery, beginning January 1, 1961. Professor Fox is participating in the study of burns at Bellevue Hospital, and his acknowledged accomplishment in this field will add strength to the program. It is also a pleasure to announce the appointment of Dr. Ko Kaneko, Associate in Microbiology, on September

15, 1961. Dr. Kaneko is especially concerned with the investigation of metabolic pathways in higher bacteria and fungi.

Dr. Margaret Holden, Special Lecturer in Microbiology, left the department to take a new position at New York University. Dr. Holden retired officially in 1958, at the rank of Associate, after more than thirty years of devoted and fruitful service to Columbia as a teacher and investigator.

During the year five graduate students were in residence as candidates for the Ph.D. degree. In addition, the following persons held postdoctoral fellowships from the indicated agencies: Dr. Giuseppe A. Andres, Dr. Vincent P. Butler, Jr., and Dr.

Donald M. Marcus, the Helen Hay Whitney Foundation; Dr. Stuart F. Schlossman, The National Foundation; Dr. Berge Hampar, Dr. Michael Mage, and Dr. Arthur J. L. Strauss, the United States Public Health Service, and Dr. GianCarlo Nava, the Damon Runyon Memorial Fund.

The department was honored by visits from several distinguished foreign guests, including Dr. Robert Cruickshank, University of Edinburgh; Dr. Peter Wildy, University of Glasgow; Dr. Seiichi Matsumoto, Kyoto University; Dr. V. M. Zhdanov, Academy of Medical Sciences, U.S.S.R.; Dr. Bernal Fernandez, University of Costa Rica, and Dr. Joseph Huppert, Pasteur Institute, Paris.

Professor Rose, in collaboration with Professor Alice W. Knox, made further studies of acute non-bacterial respiratory infections among the military population at Fort Dix, New Jersey. Type 3 adenovirus was found to play an important role in such infections, in addition to type 4 and type 7, and it was noted that immunization with a vaccine containing the latter types of virus was relatively ineffective against respiratory illness caused by type 3. Work is currently under way with the object of determining the extent to which other types of viral agents participate in respiratory infections among this population, and new methods are being sought for rapid, early, and specific diagnosis, employing the principle of tagging viral antigens in secretions of the respiratory tract with fluorescein-conjugated antibody. Professor Rose was appointed to the Scientific Advisory Committee, New York City Health Research Council; the Scientific and Educational Committee, Allergy Foundation of America, and the Committee on Education, New York Academy of Medicine.

An account of Professor Elvin A. Kabat's work, which is carried out in laboratories at the Neurological Institute, under the Departments of Microbiology and Neurology, is given in the report of the latter department.

Professor Beatrice C. Seegal and Professor Konrad H. Hsu conducted further investigations on the mechanism of experimental glomerulonephritis, in a cooperative program with Professor Councilman Morgan and Dr. Andres. Ferritin-conjugated antibody was used to identify, by electron microscopy, the area of localization in rat kidney of specific antirenal serum. It was found that nephrotoxic antibody was concentrated during acute nephritis in glomerular basement membranes and, to a lesser extent, in cytoplasm of glomerular endothelial and epithelial cells. In these latter cells it was present also, in high concentration, in basement membrane-

like material that occurs in cisternae. Double labeling of antibody with ferritin and fluorescein permitted a single antiserum to be used for examining renal sections by electron microscopy and ultraviolet light microscopy.

Dr. John B. Zabriskie, Fellow of the Rockefeller Institute, continued his association with Professor Seegal's laboratory, in order to pursue fluorescent antibody studies of surgically removed cardiac auricular appendages and of selected cardiac tissues obtained at autopsy from cases of acute rheumatic fever. Promising results were obtained with a method of fixing the tissues in cold acetone and embedding them in paraffin, so that contiguous sections in a good state of preservation could be stained with fluorescent antibody, as well as by conventional methods. Dr. Holden extended her studies with Professors Seegal and Hsu concerning the *in vivo* effect of adrenocorticosteroids on infection of rabbits with vaccinia virus. Steroid-treated animals developed a more severe infection than did controls, and fluorescent antibody revealed that viral antigen was distributed more widely and in greater concentration in tissues of the treated rabbits. Nine days after infection, when the control rabbits were convalescing and their tissues no longer contained demonstrable viral antigen, the treated animals were dead from generalized infection. Professor Seegal, in association with Dr. Melvin D. Yahr, Associate Professor of Clinical Neurology and Attending Neurologist, undertook the examination, by means of fluorescent antibody, of central nervous system tissues removed either surgically or at autopsy from patients with demyelinating disease. The objective of this work was to determine whether human gamma globulin is deposited at the sites of demyelination and thereby to gain further evidence on the possible role of antigen-antibody reactions in such disease.

Professor Claus W. Jungeblut, in association with Dr. Helen Kodza, found that transmission of a leukemogenic agent in guinea pigs could be regularly obtained with the supernatants of leukemic spleen after the cells had been ruptured either by ultrasonic vibration or by repeated freezing and thawing and the preparation then centrifuged at high speed. Transmission also was effected with the blood plasma of leukemic animals and with the filtrates of leukemic spleen after passage through a millipore membrane with average pore diameter of 0.6 micron. Cross-mating of susceptible with resistant strains of guinea pigs produced F1 hybrids that were uniformly susceptible to leukemia. Further cross-mating of F1 guinea pigs, so as to obtain F2 hy-

brids, yielded nine susceptibles out of thirteen animals in one experiment. The results suggest that susceptibility may be inherited according to Mendelian laws. Experiments with a wild strain of lymphocytic choriomeningitis virus indicated that infection with this agent can favorably modify the course of leukemia in guinea pigs, and that LCM virus acts as an interfering agent, even though an interferon-like substance could not be demonstrated in the tissues of infected animals.

Professor Calderon Howe adduced evidence that the enzyme, neuraminidase, which is associated with strains of influenza virus, is a distinct entity and that it is separable from viral hemagglutinin. The effect of purified neuraminidase on mucopolysaccharide substrates was investigated and information concerning the split products of its enzymatic action was obtained. From this work it was ascertained that, although the primary function of the enzyme is to release neuraminic acid from the substrate, the mere occurrence of this acid in mucopolysaccharides is unrelated to their capacity to act as inhibitors of viral hemagglutination. Professor Howe took sabbatical leave during the academic year 1961-62, under a Commonwealth Fund Fellowship, in order to continue this work and to enlarge on some of its immunochemical aspects in the laboratories of Professor Pierre Grabar, Director, French National Cancer Institute, Paris, France.

Professor Morgan, in association with Professors Knox and Hsu, continued to investigate the use of ferritin-conjugated antibodies for localizing the sites of intracellular viral antigen. Influenza viral antigen appeared as aggregates of dense material within the nuclei of infected cells, but the antigen was diffusely spread in the cytoplasm. Of particular interest was the observation that the surface membrane of many cells accumulated viral antigen during the course of infection with influenza virus. Intracellular vaccinia virus was tagged with ferritin-conjugated antibody, thus permitting specific immunologic identification of the virus.

Professor Gabriel C. Godman studied the cytologic and chemical consequences of infection of cultured cells with ECHO 9 virus, in collaboration with Professor Morgan and Dr. Richard A. Rifkind, Trainee in Medicine and Assistant Physician, and Dr. Ivan E. Shalit, Assistant Resident in Medicine. The alterations in cellular organelles and the sites of formation of antigen and of the markedly augmented quantities of ribonucleoprotein were examined at successive stages of infection and the pathway of radio-isotopically marked precursors of nucleic acids was traced through the infected cell.

Dr. Arline Deitch investigated the quantitative relations of nucleoproteins in the nuclei of cells of the lymphocytic and plasmacytic series at successive stages of their maturation, with the object of assessing nuclear function in these cells during protein formation and preparation for division, as well as the relationships among these cells. Dr. Charles Morris, Postdoctoral Fellow of the National Institutes of Health, Department of Medicine, examined the effects of cell division and of certain hormones on the synthesis of sulfomucopolysaccharide by connective tissue cells. In related experiments, Professor Godman attempted to localize the cellular sites of formation and secretion of sulfomucopolysaccharide and collagen with radioisotopic precursors, using a technique to permit visualization of the site of labeling in the electron microscope. Dr. Nathan Lane, Associate Professor of Surgical Pathology and Associate Attending Surgeon, worked in the laboratory of Professor Godman on the structure and possible viral etiology of intestinal neoplasms.

Professor Sam M. Beiser investigated the chemical, immunochemical, and biologic properties of steroid hormone-protein conjugates, in association with Professor Bernard F. Erlanger, Dr. Frederick J. Agate, Jr., Associate Professor of Anatomy, and Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology). Evidence for anti-hormonal activity of antibodies to aldosterone, estrone, and progesterone was obtained in addition to the anti-hormonal activity previously demonstrated for antibodies to testosterone. In collaboration with the Department of Urology, it was demonstrated that humans can be immunized with testosterone-protein conjugates. Five of eight immunized patients produced precipitating antibodies in their sera. Studies were also made in the attempt to develop a method of immunologic assay for steroid hormones and it was found that steroids inhibit the hemagglutination, by specific antiserum, of red cells coupled with steroid-protein conjugates. The inhibition obtained, however, was not sensitive enough to be useful in detecting the extremely small amounts of steroids present in serum. Dr. Nava investigated DNA-mediated transformation in the pneumococcus and showed that double-stranded DNA, obtained from bacteriophages and other sources, inhibited transformation, whereas naturally occurring single-stranded DNA obtained from bacteriophage ϕ X174 failed to do so. Attempts to demonstrate a receptor in competent pneumococci, i.e., pneumococci susceptible to transformation, apparently were successful. Transformation was inhibited by globulin fractions from the sera of rabbits

immunized with competent cells but not by similar fractions from the sera of animals immunized with non-competent cells. This appears to be the first direct evidence for the presence of a "transformation" receptor on competent pneumococci. Investigation of the specificity of the combining sites of proteins in response to the same determinant group was continued in collaboration with Professor Stuart W. Tanenbaum, Professor Emmett W. Bassett, and Dr. Mage. These studies are described in Professor Tanenbaum's report. Dr. Jaroslav F. Hulka, Josiah Macy, Jr. Foundation Fellow, Department of Obstetrics and Gynecology, left in August to become Assistant Professor of Obstetrics and Gynecology, University of Pittsburgh. In collaboration with Professor Hsu, Dr. Hulka demonstrated the presence of antibodies to trophoblasts in human post-partum serum. Dr. Butler arrived in September to obtain training in immunochemistry and to participate in the research program. Dr. Stanley Cohen investigated the uptake of plasma proteins by neoplastic liver cells during his elective period as a fourth-year medical student and for this work he received the Borden Award, which is given annually to the senior judged to have performed the most creditable and imaginative research during his undergraduate years.

Professor Tanenbaum and associates continued studies on the biosynthesis of prototypical cyclic compounds by *Penicillia*. The structure of a new tropolone derivative was elucidated by Dr. Pandurang V. Divekar and Dr. Paul E. Brenneisen. Additional aliphatic compounds which are presumptive precursors of the tropolone ring system were isolated by Dr. Brenneisen. Subsequent to Dr. Divekar's return to India and Dr. Brenneisen's return to Switzerland, Dr. Kaneko joined Professor Tanenbaum to maintain research into the biosynthetic pathways leading to the pyridine derivative, dipicolinic acid. In collaboration with Professor Beiser and Professor Bassett, a rapid, high-yield method for the isolation of anti-hapten antibodies was developed. Further modifications of this procedure by Dr. Mage led to the isolation of highly purified rabbit antibodies to the glucosyl- and galactosyl-radicals. These purified antibodies were examined for carbohydrate, total amino acids and end-groups by Dr. Mage and Professor Bassett. Enzymatic degradations and "fingerprint" analyses of the resultant peptides were undertaken. Professors Tanenbaum and Beiser, aided by Mrs. Gertrude C. Burke, studied the competition of enzymes and antibodies, specific for the galactosyl determinant, for a common complexant. Dr. Butler initiated experiments on the synthesis of antigens containing nucleic acid

components and the characteristics of antibodies to these antigens.

Professor Erlanger, in collaboration with Dr. William Cohen, continued his investigation of the mechanism of action of chymotrypsin. Inhibition and reactivation studies yielded information about the conformation of the active site of chymotrypsin. Chemical modification of this enzyme revealed the presence of a hitherto unknown conformation-sensitive functional group at or near the active center of chymotrypsin. Similar studies were carried out on the proteolytic enzyme trypsin, for which a novel chromogenic substrate was designed and synthesized. Studies of the effect of enzymatic degradation upon the activity of trypsin were initiated with the purpose of isolating active fragments of relatively low molecular weight. The investigation of the chemical, immunochemical and endocrinological properties of steroid protein conjugates was extended, in association with Professors Agate, Beiser and Lieberman, and Dr. Paula Zimmering, Research Associate in Biochemistry (Obstetrics and Gynecology). In collaboration with Professor Beiser, the use of specific antisera for the assay of steroids was studied. Antibodies to chlorophyll conjugates were obtained and studied, in collaboration with Professor Beiser.

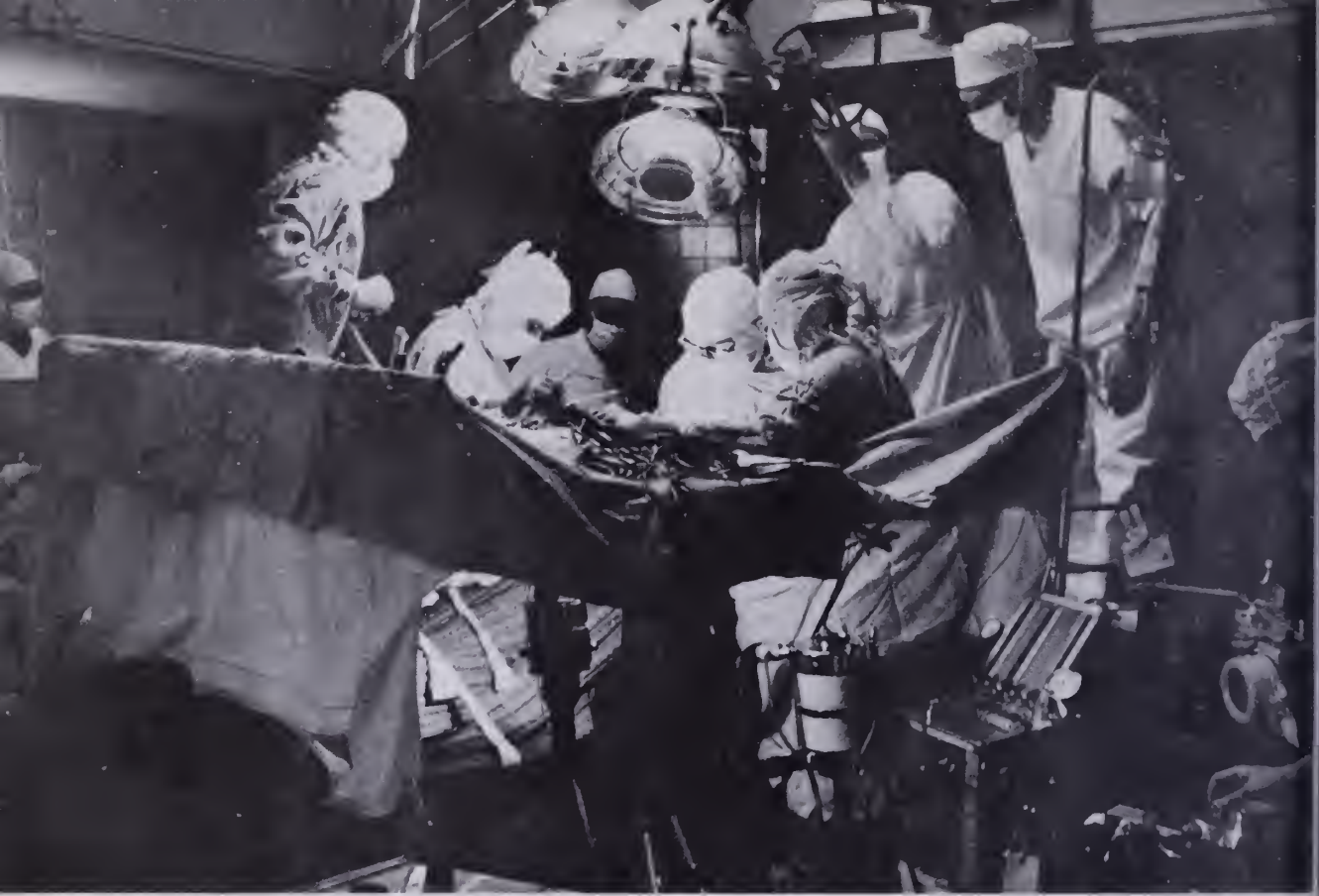
Professor Solon A. Ellison continued his studies of human saliva, in collaboration with Professor Irwin D. Mandel, School of Dental and Oral Surgery. A comparative study of the proteins and glycoproteins of parotid saliva from caries-immune and caries-susceptible adults was completed. The saliva of caries-immune females was found to be distinctly different from that of caries-susceptible women. No differences were observed between the two male groups or the caries-susceptible females and the males. The chemical and electrophoretic data indicated that glycoproteins in the saliva of caries-immune women differ qualitatively from those in the other groups. Studies of the components of saliva separated by column chromatography were made. Comparison of human salivary and pancreatic amylase was begun and it was ascertained that these two enzymes differ immunologically, although they cross-react extensively. In attempting to ascertain the role of salivary components in calculus formation, it became important to differentiate protein-bound from unbound calcium. The difficulties encountered using the published methods for this analysis led to the development of a new method for separating these two forms of calcium. Chromatography on *Sephadex* revealed that salivary calcium could be readily partitioned into two moieties,

one of which migrated with the proteins, whereas the other was retarded on filtration and was eluted as a distinct, protein-free fraction. This method is now being used in studies of calcium-binding by the several salivary constituents. Studies of the effects of viral infection upon a strain of cultured Chinese hamster cells were undertaken with Dr. Hampar and showed that a "carrier" culture could be produced by infection of these cells with herpes simplex virus, although cytopathogenic effects were absent. Cytologic studies demonstrated that infection caused chromosomal aberrations similar to those known previously to result from X-irradiation or the exposure of cells to triethylene melamine and bromodeoxyuridine. The significance of these findings with respect to the possibility of cellular mutations induced by animal viruses is now being studied. Observations on the radiobiology of bacteriophages were extended, in collaboration with Dr. Rose R. Feiner, College of the City of New York, and Dr. Ruth F. Hill, Assistant Professor of Radiology (Physics). In seeking an explanation for the differences which had been noted between *E. coli* B and *E. coli* B_r with respect to their ability to support the

growth of UV-irradiated T-phages, measurements were made of the capacity of radiological mutants of *E. coli* B for phage T1. It was found that despite the extreme sensitivity of *E. coli* B_r to inactivation by UV-irradiation, the capacity of this strain was at least as resistant to destruction as was the capacity of the radiation-resistant organism, *E. coli* B/r.

The laboratories of the diagnostic service performed 67,112 examinations, not including bacteriophage typing of 2,303 strains of *Staphylococcus aureus*.

The department gratefully acknowledges support of its research activities from the American Cancer Society, American Otological Society, Bristol-Meyers Company, the Jane Coffin Childs Memorial Fund, General Ceramics Company, the Philip Hanson Hiss, Jr. Memorial Fund, the Leukemia Society, the Mary Murray Mahony Fund, the Population Council, the National Foundation, the National Institutes of Health, the National Science Foundation, the Office of Naval Research, the Office of The Surgeon General, Department of the Army, and Harry M. Stevens, Inc.



Neurological Surgery

J. LAWRENCE POOL

Professor and Chairman of the Department • Director of Service

During the year, construction of the splendid, much needed intensive care unit on the ninth floor of the Neurological Institute was completed.

The year has seen improvements both as to the number and quality of the surgical treatment of intracranial vascular lesions, particularly as to aneurysms and arteriovenous malformations of the brain. In addition, the Zeiss dissecting microscope is being used as an aid in certain brain operations. Stereotaxic surgery for Parkinson's Disease and allied disorders has also progressed, largely under the direction of Dr. Edgar M. Housepian, in collaboration with Professor Dominick P. Purpura. One young man, so operated upon for dystonia, has just been inducted into the Army.

The scope of neurosurgical procedures performed

at the Neurological Institute is recorded in the following table.

OPERATIONS FOR 1961	
Cranial	494
Spinal	292
Minor	63
Diagnostic	64
Miscellaneous	69
	<hr/> 982

In addition to this, 101 procedures were performed in the Presbyterian Hospital

101
1,083

The technique and use of Risa scanning of the

brain has also been extended, and its worth well demonstrated through the efforts of Professor Edward B. Schlesinger, in collaboration with his able technician, Miss Shiela DeBoves; Dr. Juan Taveras, Professor of Radiology and Attending Radiologist; Dr. Harald Rossi, Professor of Radiology (Physics), and Dr. William Gross, Assistant Professor of Radiology (Physics).

During the year ninety visiting neurosurgeons representing fifty-two countries observed operations at the Neurological Institute. There were twenty-seven representatives from South America, seven from Great Britain, five from Russia, five from Japan, four each from India, Yugoslavia, Italy, and France, and others from Syria, Greece, Australia, and South Africa.

There have been several changes in the staff during the year. Associate Professor Joseph Ransohoff resigned his post here after 12 years to become Chairman and Professor of Neurological Surgery at New York University-Bellevue Medical Center. Associate Professor James B. Campbell will resign his post here as of December 31, 1961, to become Associate Professor of Neurological Surgery at New York University School of Medicine.

Staff Activities

Professor J. Lawrence Pool has continued his interest in the neurosurgical treatment of anterior communicating artery aneurysms, arteriovenous malformations and temporal lobe epilepsy. Professor Pool is serving as co-chairman of the Medical Center Development Fund Campaign for the new Alumni Auditorium at the College of Physicians and Surgeons. He was also appointed chairman of a committee to study neurosurgical standards in the City of New York. Professor Pool continues his appointment as a member of the American Board of Neurological Surgery, and is also serving as Chairman of the Section on Neurology and Psychiatry of the New York Academy of Medicine.

A major undertaking in the neurosurgical research laboratory of Professor Campbell is a study of the regenerative potential of the peripheral nervous system and spinal cord directed at improving clinical methods for peripheral nerve repair and alleviating the paraplegic state. This work has been done in collaboration with Dr. C. Andrew L. Bassett, Associate Professor of Orthopedic Surgery and Associate Attending Orthopedic Surgeon, and Dr. Sheila Donahue, Assistant Professor of Neuropathology. Another undertaking in this laboratory is the development of a method for stereotaxic placement of radio-necrotizing agents in the brain of man in order to

alleviate dyskinetic states. Mr. Bruce J. Biaviti, Research Assistant in Physics at Columbia University, Dr. Marion H. Biavati, Research Scientist in Radiology, Alvin G. Fox, Research Worker in Radiology, Dr. Erich G. Krueger, Clinical Professor of Neurological Surgery, Bronx Veterans Administration Hospital, and Dr. Harold H. Rossi, Professor of Radiology (Physics), have all worked with Professor Campbell on this project.

In the laboratory of Professor Dominick P. Purpura, four general areas of investigation have been carried out: 1) Post-natal development of the mammalian cerebral cortex including electrophysiological as well as morphological and biochemical studies of the developing cat brain. The following investigators participated in these studies as collaborators or students: Dr. Charles R. Noback, Associate Professor of Anatomy; Dr. Soll Berl, Instructor in Biochemistry; Mrs. K. Voeller, medical student; Dr. Eli S. Goldensohn, Assistant Professor of Neurology and Associate Attending Neurologist, and Robert J. Shoefer and Bernice Lipkin, Research Fellows. 2) Organization of thalamocortical and extrathalamic pathways to the motor cortex in collaboration with Dr. Bernard Cohen, Research Fellow, United States Public Health Service. 3) Analysis of steady potential alterations in experimentally induced focal epileptogenic lesions. Participants in these studies included Professor Goldensohn, Mr. S. Musgrave and Mr. M. Sanaman, medical students. 4) Effects of injected ammonia on amino acid and protein metabolism of cerebral cortex in collaboration with Dr. Heinrich Waelsch, Professor of Biochemistry (Psychiatry), and Dr. Berl.

Professor Lester A. Mount was honored this year by being elected President of the Neurosurgical Society of America. Professor Mount has continued studies of the collateral circulation of the brain in the vertebral basilar distribution with Professor Taveras.

Professor Schlesinger has continued his analysis of techniques of isotope scanning of the brain leading to information on characteristics of various lesions, and improved isotopes and collimation. Professor Schlesinger has also conducted a study of postoperative patients to ascertain the nature of operative response and early appearance of evidence of brain tumor recurrence. A study has also been done on the effect of x-ray therapy on gliomas with elimination of other variables in treatment with Professor Taveras. A three-year follow-up on arteriovenous malformations is also underway to see if they responded to tumoricidal x-ray therapy. A series of cases of carotid occlusion has been studied by ex-

ternal isotope counting techniques and an attempt to develop a normal/abnormal graph of flow characteristics is being made. Plasminogen and fibrinogen are being tagged for use in possible identification of clots by external counting. Experiments on diathermy effect on tissue are also being carried out to clarify the conflicting reports in the literature and to develop its possible therapeutic use by altering specific areas within the brain. Finally, an attempt to study cerebral edema in patients undergoing radiotherapy in order to develop agents as adjuncts to therapy of cerebral edema is being done with Professor Taveras and Dr. John N. Potanos.

In the laboratory of Professor James W. Correll, investigation has continued as to the influence exerted by the nervous system on lipid metabolism, as follows: A functional innervation of adipose tissue has been demonstrated in rabbits showing that adipose tissue has the capacity to be an important effector organ. Investigation of the pathways and centers within the central nervous system indicate that stimulation of hypothalamic areas results in activity of adipose tissue. Preliminary observations on human beings, carried out with Dr. Charles W. Simpson, provide evidence that the ability of adipose tissue to respond is decreased by the presence of pituitary adenoma or by lesions involving the hypothalamic regions. Studies to define the neural structures important in the innervation of adipose tissue are being carried out in collaboration with Dr. Malcolm B. Carpenter, Associate Professor of Anatomy.

Dr. Thomas J. Bridges has been conducting extensive investigations on various chemical and surgical methods of relief of pain with various associates at the Francis Delafield Hospital. Palliation of breast cancer, by hypophysectomy, is being studied by Dr. Bridges with Dr. Cushman D. Haagensen, Professor of Clinical Surgery and Attending Surgeon, Professor Daniel C. Baker, Clinical Professor of Otolaryngology and Attending Otolaryngologist, and, for prostatic cancer, by Dr. Ralph J. Veenema, Assistant Professor of Clinical Urology and Assistant Attending Urologist. Arterial pulsations transmitted by the cerebrospinal fluid are being recorded by Dr. Gerald Ross and Dr. Bridges in order to determine whether cerebrospinal pulse pressure may be used as a diagnostic aid to detect impairment in cerebral circulation, in similar fashion to peripheral arterial oscillometry.

Dr. Housepian continues his basic investigations on thalamic physiology with particular emphasis on motor organization and intrathalamic relations and further studies on electrophysiological and morpho-

logical characteristics in ontogenesis of pyramidal and extrapyramidal systems of the cat with Professors Noback and Purpura. Electrophysiological techniques which have been applied to clinical investigations on patients undergoing surgery for a variety of dyskinesias, particularly Parkinson's Diseases, have led to the development of physiological methods of identification of subcortical regions approached stereotaxically. The work has been done with Professors Purpura, Goldensohn, and Pool. With Dr. Leon Roizin, Associate Professor of Neuropathology (Psychiatry), histochemical and electron microscopic studies have been in progress on small human cortical and subcortical specimens in an effort to elucidate the pathogenesis of certain dyskinesias. Dr. Beatrice C. Seegal, Professor of Microbiology, and Professor Melvin D. Yahr of the Department of Neurology have pursued immunochemical studies on similarly available specimens in a program of investigations on the possible role of auto-immunization in multiple sclerosis.

Dr. John N. Potanos has studied the purine and pyrimidine metabolism in normal and neoplastic tissues of the central nervous system with Dr. Abner Wolf, Professor of Neuropathology and Attending Neuropathologist; Dr. David Cowen, Associate Professor of Neuropathology and Associate Attending Neuropathologist, and Dr. Lester Geller, Associate in Neuropathology. Culture of normal and neoplastic tissues of the central nervous system by cytogenetic technique have been investigated with Dr. Samuel Graff, Professor of Biochemistry, and Dr. Frank Boschenstein, Visiting Fellow (American) in Neurology. Studies on the physiology and technique of profound regional hypothermia with Dr. Charles Wycoff, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist, and metabolism of pyruvate in central nervous system tissues with Dr. Aaron D. Freedman, Assistant Professor of Medicine (Biochemistry), and Professor Graff also have been continued by Dr. Potanos.

Professor Krueger and his staff have carried out investigative work in the evaluation of intra-osseous venography in the diagnosis of lesions of the lumbar and also of the dorsal spine. Venography has now been carried out in approximately 120 patients with an attempt to extend the investigation to lesions of the dorsal spine and also to the cervical spine. Professor Krueger is also participating in a cooperative study of the natural history of lumbar disc protrusions, instituted by the National Academy of Sciences and the Veterans Administration as a member of the Executive Committee.

Resident Activities

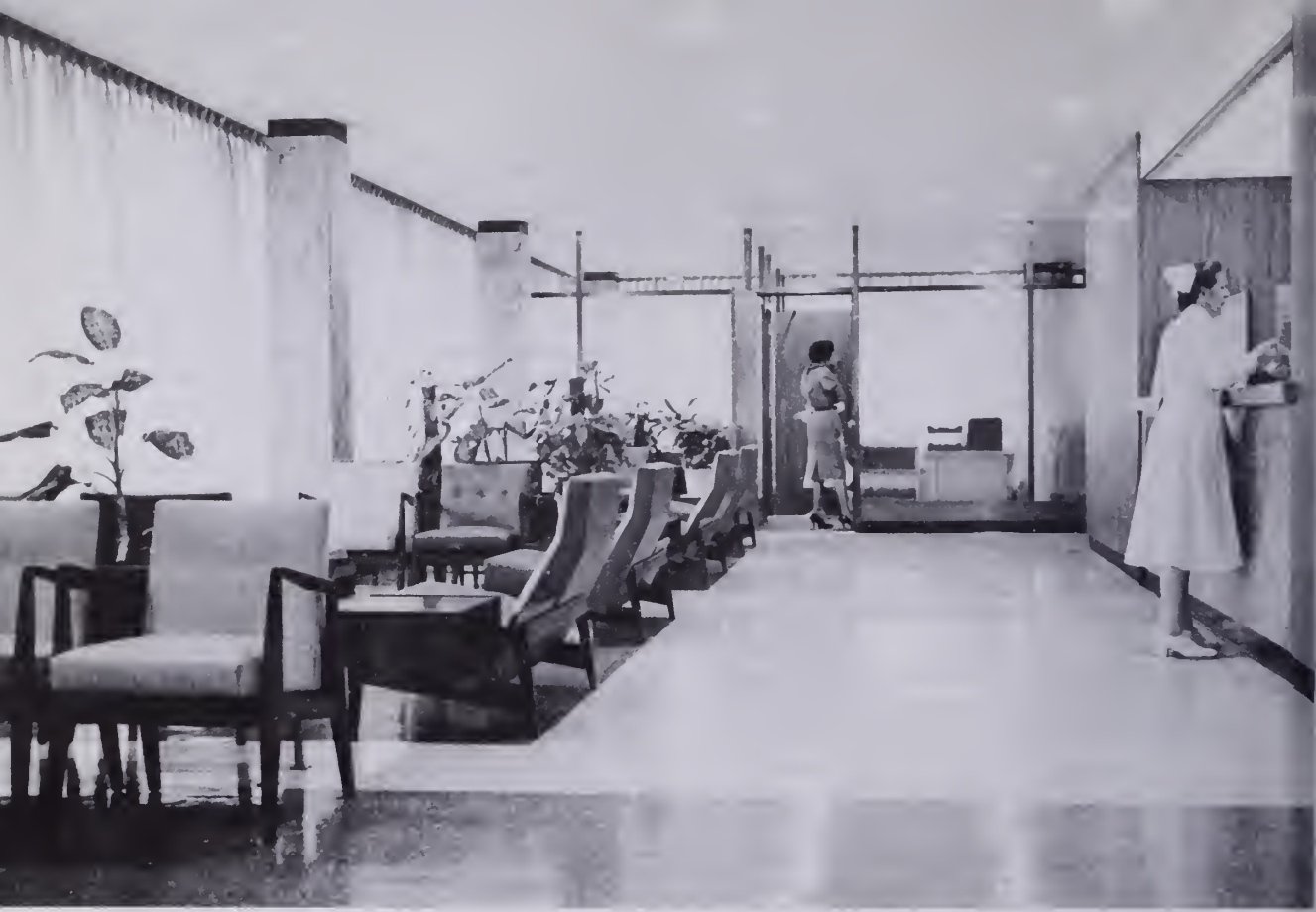
Dr. Arnold Schoolman has been doing investigative work on the role of suprapontine mechanisms in the regulation of respiration, multi-electrode for electromyography of the diaphragm in waking cat, chronically implanted carotid artery cannula for study of PCO_2 and Ph in the awake cat; superior cervical ganglion resector and effects of cerebrospinal fluid fluctuations and intraventricular recording electrode.

Dr. Bennett M. Stein has been investigating the study of cerebroarteriosclerosis in over one hundred cases in conjunction with Dr. William McCormick, Special Visiting Fellow in Neuropathology; Dr. Jesus N. Rodriguez, Trainee in Radiology, and Professor Taveras.

Dr. Gerald Ross has been working in conjunction

with Dr. Charles W. Simpson on cases of aqueductal stenosis of late onset.

The research work of the department and the service was supported by grants from the National Foundation, the American Cancer Society, Inc., the Paul Moore Research Fund, the National Institute of Neurological Diseases and Blindness, United Cerebral Palsy Research and Educational Foundation, Parkinson's Disease Foundation, Charles E. Merrill Trust, the Research and Development Division of the Office of the Surgeon General, Department of the Army, the Department of Medicine and Surgery of the Veterans Administration, the Quaker Oats Company, the Donner Foundation, Mrs. Rodgers Denckla, the Marcus Gift for Brain Tumor Research, the John Gunther Memorial Gift for Brain Tumors in Children, and the United States Public Health Service.



Neurology

H. HOUSTON MERRITT

Professor and Chairman of the Department · Director of Service

The year 1961 was marked by the completion of the second stage of the remodeling of the Neurological Institute. New quarters for the Department of Neuroradiology have been established on the ground floor, greatly expediting the work of this department which has assumed an ever increasing importance in the diagnosis and treatment of patients with disorders of the nervous system. The eighth floor of the Neurological Institute has been reconstructed with additions to the wings. This will make it possible for the Department of Physiotherapy to extend their activities in the therapy of the patients on the wards of the Neurological Institute and the establishment of a new rehabilitation ward of sixteen beds.

The teaching activities of the department remain

at their previous high level. The elective course in clinical neurology continued to be popular with our students and also attracted a number of students from medical schools in various sections of the country.

The laboratories of clinical electroencephalography at the Neurological Institute and in the Presbyterian Hospital under Professor Paul F. A. Hoefer have again carried a heavy patient load. Over 6,000 cases were tested. In addition, several hundred electromyographic examinations and a similar number of chronaxie tests were performed.

Dr. Joseph L. O'Brien and Dr. Robert A. de Napoli are investigating changes in the conduction velocity of motor nerve in various disorders, especially in amyotrophic lateral sclerosis. Professor

Joseph Moldaver and Dr. de Napoli are performing combined chronaxic and muscle action potential studies in cases of denervation and myopathies.

Dr. Maria Ungo De Folle, from Montevideo, Uruguay and Dr. Hedayat Khaghani, Professor of Psychiatry at the University of Tabriz, Iran, were trained in the laboratories of the department.

Professor Hoefer with Dr. Henry Aranow, Jr., Associate Professor of Clinical Medicine and Associate Attending Physician, and Professor Lewis P. Rowland has continued his studies in myasthenia gravis. Professor Hoefer with Dr. de Napoli and Dr. Margaret R. Seiden is reviewing the electroencephalographic and clinical findings of verified brain tumors collected in the department.

New recording and stimulating apparatus being developed in the department by Mr. Leonard Zablow include a device for single electrode stimulation and recording for human muscle fibers in situ, a new clinical chronaximeter and an improved impedance spirometer to be used with electroencephalographic recording.

Professor Hoefer was elected to affiliate membership in the Royal Society of Medicine, London, England. During the academic year 1961-1962 Professor Hoefer was on sabbatical leave.

Two of the Fellows in pediatric neurology completed in June their three year training program and assumed academic positions. Dr. Melvin Greer became Assistant Professor of Neurology and Pediatrics at the University of Florida and Dr. Arnold P. Gold was appointed Assistant Professor of Neurology (Pediatrics) at the College of Physicians and Surgeons, Columbia University.

Dr. Gerhard Nellhaus continued his studies on experimental epilepsy in rabbits with particular reference to a strain susceptible to audiogenic seizures. Drs. Abe M. Chutorian and James F. Schwartz have initiated a study of optic atrophy in children. Professors Sidney Carter, James F. Hammill and Rowland have carried out a clinical study of anterior horn cell disease in children. Professor Carter has completed one aspect of a long range study of vascular disease of the brain in children and the results were presented at the Second International Congress of Neurosurgery in Washington, D. C. in October in conjunction with Professor Gold and Dr. Joseph Ransohoff, Associate Professor of Clinical Neurological Surgery and Attending Neurological Surgeon.

Professor Carter is Chairman of the Professional Advisory Council of the Association for Brain Injured Children; Director of the American Board of Psychiatry and Neurology; Chairman of the Professional Advisory Council of United Cerebral Palsy

of New York City, and Trustee of the American Academy of Neurology.

Professor Melvin D. Yahr in association with Dr. Beatrice C. Seegal, Professor of Microbiology, and Dr. Bernard O'Connor is conducting studies in patients with demyelinating diseases, utilizing the fluorescent antibody technique in an effort to determine sites in the central nervous system in which gamma globulin is bound. It is hoped that these studies will lead to a better understanding of the mechanism of demyelination. Professor Yahr has continued, in association with Professor Robert A. Fishman, the studies correlating serum dilantin levels with clinical effects in patients with convulsive disorders. The effectiveness of two new therapeutic agents, Riker 594 and Metaxalone, in the convulsive disorders have been studied during the past year by Professor Yahr and Dr. Ralph W. Richter. Metaxalone has also been shown to have muscle relaxant properties and its effects in neurological conditions with spasticity are being studied.

Professors Yahr and Hammill, with Dr. de Napoli and members of the Department of Neurological Surgery, have continued their studies on subarachnoid hemorrhage due to rupture of intracranial aneurysms and arteriovenous malformations.

Professor Yahr is Secretary-Treasurer and Editor of the Transactions of the American Neurological Association and Consultant to the Council on Occupational Health of the American Medical Association.

During the past year, Professor Rowland has continued to work with Dr. David Shemin, Professor of Biochemistry. Progress was made in studies of the enzymatic basis for the conversion of delta-amino-levalulinic acid to succinic acid and a one-carbon fragment. The possibility that a defect in one of these enzymes exists in acute intermittent porphyria is being investigated. With Miss Tessa Abramsky, graduate student, Department of Biochemistry, Professors Shemin and Rowland have also demonstrated that beta-methyl aspartic acid is converted to isoleucine.

With the collaboration of Dr. Schwartz and members of several other departments, Professor Rowland studied a family with an unusual disorder which is the first of the hereditary ataxias in which there is a clue to the metabolic fault. This syndrome is characterized by a neuromuscular disorder resembling Friedreich's ataxia, retinitis pigmentosa, an abnormality of the erythrocytes (acanthocytosis), impaired gastrointestinal absorption of fat and marked deficiency of beta-lipoprotein in the serum. Others participating in this study were: Dr. Howard Eder, Professor of Medicine and Radiology, Albert Ein-

stein College of Medicine; Dr. Elliott Osserman, Associate Professor of Medicine and Assistant Attending Physician; Dr. Paul Marks, Associate Professor of Medicine and Assistant Attending Physician; Dr. Gerald Philips, Associate in Medicine (Biochemistry) and Assistant Physician; Dr. Helen Anderson, Associate in Medicine and Assistant Physician, and Dr. Erich Hirschberg, Assistant Professor of Biochemistry (Medicine).

With Professor Hirschberg, Professor Rowland has evaluated abnormal serum enzymes in the Duchenne form of muscular dystrophy, with emphasis on family studies and long term follow-up of individual patients. With Dr. Nicholas P. Christy, Assistant Professor of Medicine and Assistant Attending Physician, Dr. Kenneth Sterling, Research Associate in Psychiatry and Assistant Physician, Dr. William Drucker, Visiting Fellow in Medicine and Assistant Physician, Professor Rowland has completed a study of endocrine function in myotonic muscular dystrophy.

Professor Fishman has continued his studies of experimental obstructive hydrocephalus in collaboration with Dr. Greer, with regard to the pathogenesis of the changes that occur in the hydrocephalic cerebrum. Ventricular dilatation occurs at the expense of the adjacent white matter which, although thinned, contains an increase in water, sodium and chloride content, concomitant with a loss of lipid and protein constituents. The genesis of this paradoxical increase in water and ion content is still under study. The neurological manifestations of magnesium depletion are still under study by Professor Fishman. He is collaborating with Dr. Gerald Cohen, Associate in Biochemistry (Psychiatry), in a study of familial dysautonomia which is designed to seek a specific metabolic abnormality in this unusual inherited disease.

Professor Eli S. Goldensohn, Dr. J. Lawrence Pool, Professor of Neurological Surgery and Director of the Service, Dr. Shirley Ferguson, Research Associate in Psychiatry, and Dr. Sidney Weinstein are continuing their studies of behavior and personality in patients treated by temporal lobectomy for intractable seizures of temporal lobe origin. They are also investigating the role of this area of the brain in perception and memory and evaluating the effects of temporal lobectomy on the control of seizures.

A number of new compounds for the control of epilepsy are being evaluated by Professors Goldensohn, Carter, Yahr and Dr. John Hardie. Professor Goldensohn and Dr. Hardie completed a clinical evaluation of alpha-ethyl alpha-methyl succinimide

which has proved to be very effective in the treatment of petit mal.

Professors Goldensohn, Yahr and Dr. Stanley Fahn have continued their study on changes in the manifestations of epilepsy which have occurred in patients whose seizures began in childhood and who have been followed in this hospital for a minimum of ten years.

Professor Goldensohn and Dominick P. Purpura, Associate Professor of Neurological Surgery, have been engaged in studying the relationship between slowly changing voltages of the brain and spreading depression and the possible relationship of these electrocortical phenomena to the appearance of focal cortical seizure discharges during ontogenesis.

Professor William F. Caveness in association with Professors Peter B. Ascroft of London University and A. Earl Walker of Johns Hopkins University found the incidence of fits from missile wounds approximately the same in the soldiers wounded in the last three major armed conflicts. German records from World War I were sought in the Archives of the Hirnverletztenheim in Munich. Professor Caveness, with Dr. Verne S. Caviness, Jr., of Harvard University, in a random sample, determined the adequacy of these records for comparison with those from World War II and Korea and a full-scale analysis of 2,000 of the German records will be carried out by Dr. Karl-Heinz Leuchs of the Hirnverletztenheim and Professor J. E. Meyer of the University of Munich. Their findings will be correlated with those at hand for a more exact appraisal of the sequelae of combat head injury.

Professor Caveness and Drs. Raymond D. Adams and Paul I. Yakovlev of Harvard University have continued their work on the anatomical substrata for the evolving fit pattern in the *Macaca mulatta*. Professor Caveness, with Drs. J. R. M. Innes and Arland Carsten of Brookhaven National Laboratories, demonstrated the delayed effects of x-irradiation in the cerebral cortex of the young monkey. Further studies, with irradiation in the therapeutic range in comparable and older monkeys, are now in progress. Professor Caveness was President of the American Epilepsy Society in 1961.

Dr. Lewis J. Doshay continued his studies of patients with Parkinson's disease. Eight new synthetic compounds were studied. It was found that Librium had a beneficial action on senile tremor. Dr. Doshay collaborated with Dr. Frederic J. Agate, Jr., Professor of Anatomy, in establishing quantitative measurements of tremor and rigidity by means of specially constructed electronic machines in an attempt to differentiate various forms of tremors and the

effect of synthetic compounds on this symptom.

Professor Daniel Sciarra collaborated in a clinical evaluation of the effects of Thio-TEPA in brain tumors with Professors Pool and Ransohoff and Dr. Alfred Gellhorn, Professor of Medicine (Delafield) and Attending Physician.

Professor William Amols, in collaboration with Dr. Arthur B. Voorhees, Jr., Instructor in Surgery and Assistant Attending Surgeon, is studying the clinical aspects of liver-brain relationships, particularly in patients with porto-caval shunts, and the relationship of appearance of basal ganglia symptoms in these patients to the level of ammonia in the serum.

The training program in neuropathology, carried on by Professor Abner Wolf, under a grant from the National Institute of Neurological Diseases and Blindness, was continued with Dr. Joo Ho Sung, a former Trainee, now participating in the teaching as Assistant Professor of Neuropathology. Professor Sung is leaving to accept a position as Assistant Professor of Neuropathology at the University of Minnesota School of Medicine in February, 1962, and Dr. William F. McCormick returned to his position as Assistant Professor of Pathology at the University of Tennessee Medical School. Professors Wolf, David Cowen and Dr. Lester M. Geller, Associate in Pathology, have continued their studies of the etiology and consequences of perinatal brain damage.

Professor Wolf and Dr. Benjamin Berg, Associate in Pathology, have been engaged in studies of the changes in the nervous system of the aging rat and have described a radiculoneuropathy in these animals. The long term pathological effects of prenatal exposure to x-radiation upon the central nervous system of the rat, were reported in detail by Professor Cowen and Dr. Geller, who are continuing their investigation of the histopathological and behavioral effects of such early treatment.

An investigation of the effects of cerebral cortical lesions upon the neurological status of the rat, and an evaluation of the phenomenon of recovery of function after damage to the nervous system of these animals, is being concluded by Dr. Geller. As part of a large study of the changes in pattern and threshold of electrically induced seizures in rats, in relation to age, Dr. Geller, Professors Cowen and Wolf, together with Mr. Jacob Sarfaty, consulting engineer, are also investigating the factors involved in the impedance of tissues to a flow of alternating current. Dr. Geller, Dr. Hans Kaunitz, Research Associate in Pathology and Assistant Physician in Vanderbilt Clinic, and Miss Ruth E. Johnson, tech-

nician in Pathology, reported their findings concerning the food consumption of rats under different conditions of availability of salt.

Dr. Sheila Donahue, Assistant Professor of Neuropathology, with Dr. George D. Pappas, Assistant Professor of Anatomy, has recently published an electron microscopic study of the capillaries in the cerebral cortex of the rat at various stages of development. In conjunction with Dr. James B. Campbell, Associate Professor of Neurological Surgery and Assistant Attending Neurological Surgeon, she is also studying the fine structure of peripheral nerve and the process of regeneration in this tissue after various surgical procedures.

Dr. Edmund A. Mackey, Instructor in Neuropathology, is carrying out a series of electron microscopic studies of spinal root ganglia following peripheral nerve crush. He is also investigating the localization of acetylcholinesterase in electric organs of electric fish and the effects of an analogue of nicotinamide, 6-aminonicotinamide, on the anterior horn cells of rat spinal cord.

Dr. Paul J. Anderson, Assistant Professor of Neuropathology, is studying the histochemical and biochemical characterization of acid hydrolase activity in neural tissue by the study of lysosomal enzymes and their distribution in the normal and the pathological altered nervous system. Together with Dr. Nobuo Shimada, Fellow in Neuropathology, and Dr. S. -K. Song of the Mount Sinai Hospital in New York, Professor Anderson is also examining patterns of histochemical and morphological changes in skeletal muscle.

Professor Sung with Dr. Elliot Marcus, earlier a Visiting Fellow in Neuropathology and now in the Department of Neurology at the New England Hospital Center, has carried out an investigation of the pathogenesis of x-radiation encephalopathy in rabbits. Of interest here is an attempt to correlate behavioral changes, electroencephalographic changes in response to α -aminobutyric acid, and histological changes in the x-irradiated brains.

Dr. Murray B. Bornstein, Research Associate in Neuropathology, is applying tissue culture techniques to the investigation of experimentally produced and naturally occurring demyelinating disorders. Together with Dr. Stanley H. Appel, formerly a study Fellow in Neuropathology, he has been studying the effect of application of sera, lymphocytes from lymph nodes and white blood cells from circulating blood of guinea pigs affected with experimental allergic encephalomyelitis to myelinated cultures of rat cerebellum.

The Department of Neurology is happy to wel-

come Dr. Stanley M. Crain (Assistant Professor of Anatomy, assigned to Neurology) upon his return to the College of Physicians and Surgeons. Professor Crain will resume his studies of the intracellular potentials of nerve cells grown *in vitro*.

During the current year Dr. Gerald Stern, Senior Registrar of Maida Vale Hospital, London, England, worked with Professor Fred A. Mettler in the latter's studies of abnormal movements.

Professor Mettler has continued his investigation on star thistle (*Centaurea solstitialis*) disease. This plant grows in many parts of the world, especially in the Mediterranean area and in the Sacramento Valley. Horses, forced to feed in such areas, may develop necrotizing disease of the nigro-pallidum. Sheep, rabbits, rats and mice are evidently able to consume the plant without suffering any ill effects but monkeys proved to be difficult to maintain on diets consisting of significant amounts of homogenized or otherwise prepared fresh plant. Dry plant was found to be unable to support the nutrition of rats when used in addition to lard. In none of these animals were necrotizing lesions found. Alcohol, water and aqueous-alcoholic extracts of dried thistle have proved to be fatal for all animals tested thus far. Chronic instillation of thistle extract by means of paraesophageal catheter, placed into the stomach of semi-immobilized monkeys, has been completed in several animals. The first of one of the two of these animals which survived has shown grossly identifiable pigmentation of the interpeduncular area and bilaterally symmetrical pigmentation of the pallidum. Histological examination has disclosed siderocalcification of these regions.

Professor Mettler in association with Dr. Robert L. Thompson has continued work on the study of changes in learned behavior associated with striatal injury in monkeys and cats. With the assistance of Messrs. William J. Ayers, Maxwell A. Morfield, and Richard Schuster (all students in the Department of Psychology) and Dr. Floyd Galler, Trainee in Psychiatry and Assistant Resident in Psychiatry, the finding of impaired retention of conditioned timing behavior and of some simple visual discriminations resulting from striatal lesions is being investigated further for its behavioral and neuroanatomic specificity. At this time, animals with varying degrees of frontal lobe injury are being compared with striatally injured animals in several behavioral test situations.

The laboratory of neurophysiology under Professor Harry Grundfest has obtained new quarters outside of the Medical Center which provide over 4,000 square feet of additional space which can eventually accommodate about a dozen investigators.

Dr. John P. Reuben has been appointed a Research Associate in the department. Mr. George Katz has joined the staff as Research Associate in Biophysics and Electronics. Dr. Robert Werman resigned to become Professor of Neurophysiological Research at the Indiana University Medical Center. Dr. Bernard Cohen, Special Trainee, United States Public Health Service, has left to organize a Laboratory of Neurophysiology at the Mt. Sinai Hospital, New York. Mr. Peter Belton (University of Glasgow and United Cerebral Palsy Visiting Fellow) has become a Research Associate at the Entomological Research Institute, Belleville, Ontario. The present holder of the United Cerebral Palsy Visiting Fellowship is Dr. Kyoshi Kusano from the Tokyo Medical and Dental University, Japan. Two other newcomers are Fellows of the Rockefeller Foundation: Dr. Emilio Aljure of the University of Cali Medical School, Cali, Colombia and Dr. Leszek Janiszewski of the N. Copernicus University, Torun, Poland.

The laboratory has continued to analyze the various mechanisms by which cells generate bioelectricity, employing for this purpose microelectrophysiological studies on axons, muscle fibers and synaptic junctions of invertebrates as well as vertebrate neurons, neurosecretory cells, muscle fibers and electroplaques.

Comparative studies on crustacean and insect axons, muscle fibers and neuromuscular junctions are being carried out by Professor Grundfest and a group comprising Mr. Belton, Drs. Harold Gainer, Lucien Girardier, Kusano and Reuben. Emerging from this work is a detailed picture of the physical chemistry and pharmacology of various components of the cell membrane. Thus, relatively simple quantitative differences in the permeability of the cell membrane to ions account for various marked differences in electrophysiological responses of cells even in closely related species of animals.

Professor Michael V. L. Bennett discovered a new electric organ in the weakly electric Gymnotid *Steatogenys*. The response of its electroplaques differ from those of the main organ of the same fish, and provides a link between the monophasically discharging Gymnotids, such as *Electrophorus* (the electric eel), *Eigenmannia* and *Sternopygus* and the diphasically discharging *Gymnotus* and *Hypopomus*. The electric fishes continue to provide further examples of unusual types of electrogenic activity. Perhaps the most remarkable is the electrically excitable response of *Raia* electroplaques which manifests itself as delayed rectification and which was described in the last annual report. Recent work has now

confirmed that this response is due to increased permeability of the cell Cl^- , the first instance of electrically excitable Cl^- activation observed in animal cells.

Professor Bennett has begun an intensive study of neurosecretory cells in the caudal spinal cord (urohypophysis) of fishes. Part of this work was done with Dr. Stephen Fox, a Visiting Fellow from the University of Michigan. Different electrophysiological properties and anatomical relations have been obtained in the fluke, two species of skates, and in the goosfish. Professor Bennett has also begun to study the neurosecretory system in the pituitary of goosfish. Professor Grundfest was elected an Honorary Fellow of the American Electroencephalographic Society.

Professor Irwin B. Wilson has continued work on the theory of enzyme action in relation to the mechanism and kinetics of the reaction with inhibitors and of substrate inhibition. Dr. Sara Ginsburg has studied the chemistry of imidazolones and imidazolines and has also prepared a number of methanesulfonates which make up a new group of irreversible inhibitors of acetylcholinesterase. Dr. Richard J. Kitz, Associate in Anesthesiology and Assistant Attending Anesthesiologist, has studied the reaction of acetylcholinesterase with the methanesulfonates. Dr. Leon Kremzner has continued work on the formation of histamine, using the honey bee which makes prodigious amounts. Dr. Jean Dayan has studied phosphorylase in relationship to a theoretical means of bypassing the metabolic block in glycogen storage disease.

The neurochemistry section under the direction of Professor David Nachmansohn continued its research on the basic mechanism of the generation and propagation of nerve impulses, particularly on the chemical factors controlling electrical activity. The theory proposed by Professor Nachmansohn with regard to the action of acetylcholine has recently found a strong support by the demonstration that local anesthetics, closely related in structure to acetylcholine, specifically react with the acetylcholine receptor protein isolated from electric tissue. Dr. Henry B. Higman, Special Trainee Fellow from the National Institutes of Health, and Miss Eva Bartels have demonstrated on the monocellular electroplax preparation that local anesthetics and acetylcholine compete for the same cell constituent. Local anesthetics may thus be classified as typical "antimetabolites."

A direct action of acetylcholine and curare on the conduction of squid giant axons was demonstrated by Dr. Philip Rosenberg, Special Trainee Fellow of the National Institutes of Health. He exposed the

fibers to cottonmouth moccasin venom in concentrations and for a period of time which had no effect on conduction. After this pretreatment acetylcholine and curare rapidly and reversibly blocked electrical activity. Phospholipase A of the venom seems to be an important, although not the only factor responsible for the effects. Dr. Rosenberg in collaboration with Dr. Frank C. G. Hoskins has shown that on exposure to a series of lipid insoluble C^{14} labelled compounds, a rapid entrance into the interior of the axon took place after treatment with the venom, thus confirming directly the assumed reduction of structural barriers.

Professor Wolf-Dietrich Dettbarn has demonstrated that *Nitella* contains cholinesterase in quite appreciable amounts which belongs to the specific type found in conducting fibers of the animal kingdom. *Nitella* is an aquatic plant known to be capable of conducting impulses by electric currents in a way comparable to that of nerve fibers. The findings suggest the possibility of a role of acetylcholine in generating the currents in plants similar to that in animal tissue.

Professor Dettbarn and Dr. Rosenberg initiated also a new program for establishing relationships between acetylcholinesterase and choline acetylase and the electrical activity of single isolated electroplax. Among the first results obtained may be mentioned the evidence that the esterase inside the single electroplax is a typical acetylcholinesterase, while in the extracellular space, in the so-called ground substance, the esterase is of an entirely different type.

Professors Dettbarn and Hoskins reexamined with refined techniques the problem of the relationship between acetylcholinesterase and electrical activity in axons, measuring the enzyme activity on an intact single fiber preparation (the squid giant axon). They again confirmed that electrical activity fails when the enzyme activity falls to about twenty percent of the initial value.

Dr. H. Claire Lawler finished her studies on the physicochemical characteristics of the large polymer of acetylcholinesterase which she had obtained from electric tissue. According to lightscattering and ultracentrifuge measurements, the molecular weight of the polymer, for by about 100 monomers, is about 20-30 million.

The unique monocellular preparation of the electroplax developed by Dr. Ernest Schoffeniels is still being improved. Dr. Higman and Miss Bartels designed an interesting switching device which permits the separate recording of the transmembrane potentials across the innervated and non-innervated membrane and the potential across the whole cell.

Professor Hoskins has stimulated lobster nerves in the presence of specifically labelled glucose and has found an increase in the amount of $C^{14}O_2$ produced during stimulation over the amount during rest. The opposite relation has been found for the amount of C^{14} incorporated into total nerve lipid. Stimulated or unstimulated, about ten times as much C^{14} appears in the CO_2 evolved by nerve from glucose-1- C^{14} as from glucose-6- C^{14} . About twice as much C^{14} appears in the total lipid from glucose-6- C^{14} as from glucose-1- C^{14} .

Continuing his studies on the "geometry" of the active site of ester splitting enzymes, Dr. Allen M. Gold, Special Trainee Fellow of the National Institutes of Health, prepared a number of new types of inhibitors and studied the chemistry of their action on chymotrypsin and trypsin. Dr. Gold has completed a thermodynamic and kinetic study on the hydrolysis of a number of substances by cholinesterase. The data indicate large variations of the entropy of activation as a function of structure.

Dr. William H. Harrison, Special Trainee Fellow of the National Institutes of Health, continued his studies on enzyme mechanisms of catecholamines. He found that several enzyme systems in the adrenal gland compete with the noradrenaline methylating system, in particular ATPase and the adrenaline oxidase. It appears that two different enzymes are involved in the methylation sequence, the first catalyzing the transformation from noradrenaline to adrenaline, and the second from adrenaline to N-methyl adrenaline.

Professor Nachmansohn gave the Christian A. Herter Lecture for 1961 at New York University.

The immunochemical laboratories under Professor Elvin A. Kabat are administered jointly under the Departments of Microbiology and Neurology. Professor Gerald Schiffman, Dr. Sidney Leskowitz of the Massachusetts General Hospital, Boston, and Professor Kabat have isolated and identified a trisaccharide which is a part of the antigenic determinant of blood group A substance. This trisaccharide is made up of a terminal N-acetylgalactosamine linked α -1, 3 to galactose which is in turn linked β -1, 3 to N-acetylglucosamine. It is a more active inhibitor of A anti-A precipitation than the two disaccharides which can be isolated from it by partial hydrolysis. Professors Schiffman and Kabat together with Mr. William Thompson have studied the oxidation of the blood group substances with periodate and have shown that almost all of the fucose and galactose together with a considerable portion of the hexosamine is destroyed. The periodate resistant portion will be characterized. Professors Kabat and Schiff-

man have also been engaged in a study of antigenic determinants of blood group B substance and of the residual polymeric material after removal of the B determinants by mild acid hydrolysis, called BP1 substance. Both of these determinants differ in specificity in that intact B substance does not precipitate anti-BP1 and BP1 does not precipitate anti-B. Despite this both have been shown by enzymatic action and oligosaccharide inhibition to have terminal α -galactosyl residues which are involved in their specificity. The best available inhibitor in both systems has been found to be α -galactosyl-1, 3-galactose but this oligosaccharide need not necessarily represent the sequence for the first two units in either antigenic determinant since the B and PB1 determinants are different. Efforts to isolate active oligosaccharides from blood group B substance are continuing.

Studies on the cross reactions of type XXII anti-pneumococcal serum with dextrans have been carried out by Dr. Joel Goodman, Assistant Professor of Microbiology at the University of California, and Miss Ada E. Bezer. The findings provide further evidence of the heterogeneity of antibodies. Mrs. Rose Mage, a graduate student in microbiology, is isolating oligosaccharides from the specific polysaccharide of type III pneumococcus to obtain data on the size of the antibody combining site in this system.

Dr. Donald Marcus, a Helen Hay Whitney Fellow in Microbiology, and Professor Kabat are engaged in the purification of the enzymes in extracts of *Clostridium tertium*. Extracts of certain strains in this organism destroy blood group A substance; the extracts, however, have been found to be very complex mixtures of enzymes including β -galactosidase, N-acetylglucosaminidase, neuraminidase and peptidase. Chromatographic separation of the A splitting enzyme from the galactosidase, neuraminidase and from most of the glucosaminidase has been accomplished. Efforts to determine how the A enzyme acts on A substance are in progress.

Professor Kabat and Miss Bezer are engaged in a collaborative study with Dr. Peter Z. Allen, Assistant Professor of Microbiology at the University of Rochester, and Drs. W. J. Whelan and Pamela Taylor of the Lister Institute, London, England, on the chemical modification of dextrans with a view to correlating changes in structure with their immunochemical specificity.

The Second Edition of Kabat and Mayer's EXPERIMENTAL IMMUNOCHEMISTRY, revised and enlarged by Professor Kabat with chapters on Complement and Complement Fixation and on Kjeldahl Nitrogen

Determination by Professor Manfred M. Mayer, Professor of Microbiology at Johns Hopkins University, appeared at the end of April 1961.

Professor Kabat continues to serve on the Subcommittee on Plasma and on the Committee on Tissue Transplantation of the National Research Council, on the AIBS Biochemistry Advisory Panel to the Office of Naval Research, as Councillor of the American Association of Immunologists, as a member of the Editorial Board of the *Journal of Allergy* and the *Journal of Immunology* and as a member of the Scientific and Education Council of the American Foundation for Allergic Diseases.

Professor H. Houston Merritt was Vice-President of the Seventh International Neurological Congress and President of the International Panel on Multiple Sclerosis in Rome, Italy, September 1961. He was elected an Honorary Member of the Section of Neurology of The Royal Society of Medicine, London, and continued to serve on the National Neurological Disease and Blindness Council of The National Institutes of Health.

At Montefiore Hospital during the year Professor Tiffany Lawyer, Jr. has been evaluating the effectiveness of a thiamin antagonist, Neopyrithiamin hydrobromide, as an adjunct to low thiamin diet and the administration of amphotericin B in the treatment of torulosis. He has also been concerned with extracranial cerebral vascular disease.

Professor Arnold P. Friedman has continued investigations into the causes and treatment of headache. He has been studying blood flow through muscle, by means of radioactive Sodium 24, in patients suffering from muscular contraction and vas-

cular headaches as well as aminoaciduria in relation to migraine and cluster headaches.

Professor Seymour Solomon has continued, with Professor Friedman, to study the electroencephalographic findings in patients afflicted by headache with a view toward elicitation of the significance of focal paroxysmal abnormalities in such cases.

The research work of this department and the service was supported by grants from: Army Medical Research and Development Command, Association for the Aid of Crippled Children, Atomic Energy Commission, Federal Association For Epilepsy, Sister Elizabeth Kenny Foundation, Benjamin Lazrus Foundation, Oscar Lazrus Foundation, Peter Cass Memorial Fund, John and Mary R. Markle Foundation, Matheson Commission, Muscular Dystrophy Associations of America, Inc., Myasthenia Gravis Foundation, National Foundation, National Science Foundation, Office of Naval Research, Office of the Surgeon General of the United States, Orbach Foundation, Walter W. Palmer Fellowship Fund, Parkinson's Disease Foundation, Rockefeller Foundation, Siegfried Foundation, Irwin Strasburger Foundation, the Teagle Foundation, Inc., United Cerebral Palsy Research and Educational Foundation, United Epilepsy Association, United States Public Health Service, Rachel Mellon Walton Foundation, Abbott Laboratories, Ciba Pharmaceuticals, Hoffman-La Roche, Inc., L. B. Roerig Co., Lederle Laboratories, Merck Sharp & Dohme, Parke, Davis & Co., Richardson-Merrell Co., Riker Laboratories, Sandoz Pharmaceuticals, Wallace Laboratories, Wallace & Tiernan, Inc., Warner Lambert Research Institute and Wyeth Laboratories.



Nursing

ELIZABETH S. GILL

*Professor and Chairman
of the Department*

Director of Service

Miss Eleanor Lee retired on July 1, 1961 after many years of devoted service to the School and to the Nursing Service of the Presbyterian Hospital. She was appointed Professor Emeritus, the first such appointment to be made in the Department of Nursing of the Faculty of Medicine. Miss Lee was succeeded by Miss Elizabeth S. Gill, formerly Assistant Professor in the Department of Nursing.

Undergraduate Program

The class of 1961 graduated in June with 116 members — 93 of this group took their New York State licensing examinations the latter part of June, and the remainder took them in November. Many of the graduates stayed to nurse in every unit of the Columbia-Presbyterian Medical Center.

On September 5, 1961 The Department of Nursing, Faculty of Medicine, Columbia University opened its doors to the largest class it has ever received. The first year class consists of 163 nursing students. While most of the students come from New York, New Jersey, Pennsylvania and Connecticut, there is a liberal representation from Indiana,

Iowa, Virginia, Illinois, Rhode Island, Florida, Massachusetts, Ohio, Michigan, Tennessee, the state of Washington and Canada.

The student registration for September, 1961 was 396 for the B.S. degree program and nine for the M.S. degree program, making a total registration September, 1961 of 405.

With the ever-increasing need for scholarship aid, The Department of Nursing was most gratified to receive a very generous three year grant for this purpose from The John A. Hartford Foundation, Inc. To date twenty-one full and twenty-two partial scholarships have been awarded from this fund.

Efforts to improve curriculum are being made constantly. Revisions in the first year include continued early emphasis on the understanding and development of basic nursing skills. Concurrent nursing classes introduce and explore the concepts of problem solving, observation and communication as well as the behavioral and social aspects of patient care; the religious, economic, and cultural background of the patients are examined to assist students to understand their reactions and adjustments to illness.

As in former years, group discussions on the psychosocial aspects of patient care help in the exploration and evaluation of these concepts, not only in relation to the patients, but also in aiding the students to identify and clarify their own reactions and responses to patient behavior and to themselves as individuals and nurses.

The alteration of class format has affected the science area also. A general introductory survey of anatomy and physiology was offered for the initial ten hours. From here a consideration of the normal and deviations from the normal is undertaken, with the early introduction of disease processes.

The year of committee work done by the second year faculty resulted in two new courses in medical-surgical nursing. Both courses were designed to provide a comprehensive study of patient care with respect to individual needs, family relationships, and possibly emergency situations.

The other course which has been redesigned is concerned with patient care over a twenty-four hour period. It emphasizes the nursing needs of groups of patients, during days, evening and nights along with the planning and administration of their care. The changing role of the nurse, of various hospital personnel and of the facilities provided for patient care is pointed out.

There has been student representation on several of the sub-committees of Standing Committees in the area of curriculum — nutrition, mental health and public health, among others.

This year the students are all in one pattern of placement for their field experience in public health nursing. The students will be out in the agencies two days a week, in class one day and either in clinic or in the clinical setting for continuity of care.

Mental Health Training Program

The mental health project that began in 1956 on a grant from the National Institutes of Health has been expanding rapidly. The mental health content of the first year program has been infinitely strengthened. There has been active participation and cooperation by a group of psychiatrists appointed by Dr. Lawrence C. Kolb, Professor of Psychiatry and Director of the Psychiatric Service, and Dr. Bernard Schoenberg, Instructor in Psychiatry and Assistant Attending Psychiatrist in Vanderbilt Clinic, and a group of sociologists under the leadership of Mr. Jay Schulman.

Graduate Program

A class of nine entered the graduate program in maternity nursing as candidates for the Master of

Science degree in October, 1962. Six students completed their course and were granted the Master of Science degree in October. In June, the program was visited by two members of the New York State Board of Education and the program was approved in September. Maternity Center Association continues to contribute and to give invaluable support to this program. Dr. Susan W. Williamson, Associate Clinical Professor of Obstetrics and Gynecology, has been named Medical Director of the Graduate Program. She has been a most valuable asset to the whole program of the nine candidates for the M.S. degree.

The bulletin of the graduate program has been combined with that of the basic nursing program and thus serves to identify the graduate program more closely with the Department of Nursing and also calls wide attention to the program.

Staff Activities

Miss Elizabeth Loeb, a student in the Class of 1962, attended the International Congress of Nurses in Melbourne, Australia. She gained much from the fellowship with nurses from other countries and brought back a broad viewpoint in nursing. Professor Dorothy Reilly is attending New York University on her sabbatical leave and is doing post masters work. Professor Helen Pettit has been re-elected President of the New York State Board of Examiners. Miss Katherine Klimacek, a student in the Class of 1963, was elected to the office of Secretary in the State section of the Student Nurses Association of New York State. Professors Lee and Pettit again participated actively in the University Seminar on the Role of the Health Professions. Several faculty members have given assistance to the National League for Nursing in evaluating achievement examinations in the area of medical and surgical nursing, psychiatric nursing and nutrition.

The eighth edition of Lippincott's Quick Reference Book for Nurses has been completed, for publication in November 1961. This new edition was prepared under the direction of Associate Dean Eleanor Lee as Editor with the following author panel from the faculty: Professors Elizabeth Gill, Helen F. Pettit and Dorothy E. Reilly, Misses Beth Cameron, Dolores Farrell, Louisa Kent, Carolyn Dawson and Glenda Fregia and Mrs. Marcia Gatchall. The royalties from this book are received by the Alumnae Association of the School of Nursing for scholarship funds.

Appointments and Promotions

Miss Mary Crawford, Associate Professor and

Associate Director, was appointed as Coordinator of Maternal and Child Health. Miss Bernice Derby was appointed Assistant Director and Assistant Professor of Maternity Nursing. Mrs. Marguerite Peters was promoted to Senior Supervisor. Miss Miriam McCormick was appointed Instructor to replace Mrs. Peters. Miss Jean Tease was promoted to Assistant Professor of Nursing in the graduate program. Miss Carmen Caverio was promoted to Associate in Nursing in the graduate program and Miss Gilda Davico was promoted to Instructor. Miss Davico is responsible for the classes for prospective parents in the graduate program. Miss Eunice Messler, formerly Instructor in the second year program, was appointed as Head Nurse in the Labor Room.

The Department of Nursing has been most fortunate in being able to increase its faculty by the appointments of Miss Lyda S. Martin as Instructor to the first year faculty; Miss Mary E. Johnson as Instructor to the second year faculty; and Miss Elsa Poslusny as Instructor in the area of mental health. Miss Lorraine Betz was promoted to Associate in Nursing responsible for the third year program. Miss Betz replaces Mrs. Mary Britten who resigned to pursue full-time study at Teachers College. Miss Betz is assisted by Miss Nora Maliepaard who was appointed as Instructor to replace Mrs. Helen Ross who resigned. The Department of Nursing was happy to welcome back Miss Margaret Neubrand from Canada where she spent a year as staff nurse. Miss Neubrand was appointed as Associate in Nursing, responsible for the second year program in medicine and surgery. Miss Susan Maines was appointed Instructor in the first year program. Miss Carolyn Bedell was promoted to Instructor in pediatric nursing. Miss Nancy Graham was appointed as Instructor in the area of public health.

There have been important changes within the area of Nursing Service. Miss Lillian Oring, Administrative Assistant in the Nursing Office, was transferred to the Personnel Department to be Assistant to Mr. C. Douglas Auty, Personnel Director. Miss Ruth A. Rayner who was promoted to Administrative Assistant will be responsible for the orientation and In-Service education of graduate nurses. Miss Helen Henry was promoted to Administrative Assistant and will be responsible for the procurement and education of auxiliary nursing personnel and also for The Health Service for graduate nurses.

Mrs. Janet Monroe was promoted to Supervisor and Instructor (surgery) and Miss Margaret Eddington was promoted to Supervisor and Instructor (medicine). Important promotions were made in

the evening and night staff, viz. Miss Catherine Towey from Assistant in Nursing to Supervisor; Miss Jane Traver to Instructor and Supervisor; Miss Paula Grossman to Assistant on the Medical Service; Miss Elizabeth Arnold to Assistant on the Surgical Service. Miss Ann Becker was transferred from the administrative staff to be appointed as Head Nurse in the Recovery Room.

Mrs. Carolyn Swift was added to the staff of the metabolism unit as Assistant Head Nurse and will replace Miss Margaret Hawthorne, upon Miss Hawthorne's retirement.

Alumnae Association

In July the name of the Alumnae Association was registered with the State of New York as The Columbia University-Presbyterian Hospital School of Nursing Alumnae Association, Inc.

Clinical Activities

New appointments to the professional nursing staff for 1961 have numbered 428 to date, while resignations have totalled 403. Fifty-eight of the new appointees are graduates of our school. These nurses come from thirty-one states and from England, Canada, Ireland, Scotland, Switzerland, British Guiana, Germany, Bermuda, Norway, South America and Portugal.

Housing facilities have been taxed to the utmost in spite of acquiring four additional apartments accommodating ten nurses.

Many of our professional staff are receiving tuition aid from Presbyterian Hospital to pursue their studies. During the year we have had 165 nurses at five universities for part-time study—twenty-two studying for their Master's degree and 133 studying for their Bachelor's degree. The total cost of this aid is \$13,018. In addition seven head nurses and staff nurses have received assistance from the Arthur Williams Scholarships for a semester of full-time study. These scholarships were awarded to the Misses Lillian Vahey, Joan Lagerson, Jacqueline Siebert, Patricia Williams, Grace Mackay, Jill Reintjes, and Shiela Spelman. It is interesting to note that since 1956 there have been 938 nurses receiving tuition aid from the hospital amounting to \$70,889.

In an effort to provide better care for all patients, Special Assignment nurses have continued to give invaluable care to acutely ill patients when private duty nurses are unavailable. In addition to special assignment nurses, six nursing aide positions were authorized to render non-nursing service to patients who need constant attendance.

During the year Patient Care Committees have

been appointed by the Department of Medicine and also the Department of Obstetrics and Gynecology. Consisting of representation from the attending and resident staffs and the nursing supervisors, these committees meet monthly and discuss ways in which patient care can be improved within these services.

College aides again helped us magnificently through the difficult summer months.

In June additional positions were authorized to keep the Recovery Room open for twenty-four hours a day, seven days a week. This has resulted in better care for all surgical patients.

Under the guidance of Miss Martha E. Haber, Assistant Director, plans are in progress for staffing two newly reconstructed floors in Neurological Institute: the eighth floor for rehabilitation, and the ninth floor, which will include intensive care units for neurosurgical patients—one for children, and one for adults.

An active, varied and interesting in-service educational program has been carried on by Miss Lillian Oring, Miss Ruth A. Rayner and Mrs. Patricia Smith. This program has included special instruction to graduate nurses on the addition of medications to intravenous solutions.

During the year the Nursing Department provided eighty-six hours of classes for Red Cross Volunteer Nurses' Aides to thirty-nine persons. Of these thirty-nine volunteers taking the course, thirty-one completed it. These classes were taught by Mrs. Patricia Smith, Administrative Assistant, Miss Patricia Jones, head nurse, and Miss Jill Reintjes, staff nurse. Several staff nurses and Red Cross workers assisted with their supervision.

In September Miss Marion Cleveland, Director of Nursing Service, was asked to be technical advisor for an educational film, "The Role of Nursing in Infection Control." This film was produced by the American Nurses' Association and the National League for Nursing Film Service. The hospital scenes were filmed at Presbyterian Hospital. The film is scheduled to be released early in 1962.

Miss Oring, as co-chairman of the Medical Center Family Campaign for the Development Fund, and with the untiring help of the Assistant Directors, was rewarded for her Herculean efforts by an enthusiastic response to her appeal. A dinner at the Waldorf-Astoria in October marked the midway point in the Campaign. An inspiring speech by General Dwight D. Eisenhower perhaps was the highlight of the evening, but Nursing was especially proud of the singing of the nursing students' Glee Club, who surpassed themselves in excellence.

More and more calls have come for nurses to par-

ticipate in research projects and we regret we haven't been able to respond to them all. However, we have placed nurses in a research project in the area of infectious hepatitis, and also in the area of metabolism and other special projects.

In November the Department of Nursing was presented with a sculpture in memory of Edna L. Cladel, a graduate of the Class of 1924, who was a supervisor in Harkness Pavilion and a private duty nurse at the Hospital for many years. The bronze figure, entitled "Little Lamb," showing a young shepherd caring for a sick lamb, is the work of Marion Sanford. A plaque on the base reads, "Presented to the Department of Nursing, Faculty of Medicine, Columbia University, in memory of Edna L. Cladel, whose work exemplified the art of nursing for which this School is famed." The gift of Virginia Henderson, Research Associate of the Yale University School of Nursing, the statue was presented by her to Nancy Samuels, Student Government President.

On November 30, 1961 a memorial service for the late Miss Margaret Eliot, retired Director of Nursing who died on November fifteenth, was held in The Pauline A. Hartford Memorial Chapel. This service was conducted under the auspices of the Nursing Department and the well-filled chapel was a fitting tribute to Miss Eliot.

Professor Gill visited the University Hospitals of Cleveland, Ohio and the Riverside Hospital in Columbus, Ohio, as well as the School of Nursing at Ohio State University in May. Professor Cleveland visited Massachusetts General Hospital in Boston in September to study their new respiratory unit and the medical intensive care unit.

Professor Pettit and Miss Lorraine Betz attended the meetings of the Council of Member Agencies, Baccalaureate and Higher Degree Programs, of the National League for Nursing in Kansas City.

In May, Presbyterian Hospital and Columbia University were well represented at the National League for Nursing Convention in Cleveland, Ohio. Six members of staff and faculty and two nursing students attended.

Other conventions, institutes and workshops in which our nurses participated were: New York Heart Association conference on atherosclerosis, New York City; Association of Operating Room Nurses in San Francisco, California; American Nurses' Association Section Regional Conferences on "Improvement in Nursing Practice" (9 delegates), New York City; Teachers College Workshop on "Recreational Therapy for Emotionally Disturbed Child," New York City; two National League

for Nursing institute-workshops on "Simplified Method of Instruction for Nursing Personnel," New York City and Hartford, Connecticut respectively; American College of Surgeons, Nursing Meetings, Philadelphia; National League for Nursing Institute on Maternal and Child Health, Philadelphia; American College of Nurse-Midwives annual meeting, Cincinnati, Ohio; National Society for Prevention of Blindness conference on "Health as a Tool of Diplomacy," New York City; Child Study Association of America's annual Parent Education Institute, Cleveland, Ohio; United Hospital Fund's series of workshop-seminars, New York City; National Naval Medical Center's Television workshop for Medical and Dental professions, Bethesda, Maryland; American Hospital Association-NLN Institutes on "Nursing Service Administration" and "Night Nursing

Service Administration" in Chicago and Detroit, respectively; New York State Nurses' Association convention in Buffalo, N. Y. (4 delegates and 2 students); and the Southern New York League for Nursing institute on "Psychiatric and Mental Health Nursing," in New York City.

In April Miss Marjorie Peto, Assistant Director, was appointed by the Board of Directors of the American Nurses' Association to an advisory committee to plan for the clinical sessions at the A.N.A. 1962 Convention.

Also in April Miss Phyllis Young, Assistant Director was elected to the Board of Directors of the Nursing Bureau of Manhattan and Bronx, Inc.

The Nursing Department is most appreciative of the support and consideration given to nursing by the professional and administrative staffs.

Obstetrics and Gynecology

HOWARD C. TAYLOR, JR.

Professor and

Chairman of the Department

Director of Service



The need for patient care and teaching in a university department devoted to the broad aspects of human reproduction is obvious. Research in this field has been somewhat slow to develop and may come as a surprise to those who have not pondered the challenging problems which confront us. Because the work of obstetrics and gynecology is so directly related to the birth process itself, the problems of uncontrolled population expansion are in no small measure our responsibility. Beyond this are the possibilities that the biological attributes with which the individual must go through life are related not only to genetic constitution but to the intra-uterine environment and to the mechanical and chemical vicissitudes of labor and delivery. To work toward the expansion of knowledge in this area is a stirring objective and one toward which we can claim only a humble beginning.

For some years systematic efforts have been made in this department toward the development of a research staff which would be able to work on a number of the more important aspects of the normal and disordered physiology of reproduction. The

prospect of the new laboratories which will become available with the completion of the new research building has spurred this effort. The activities of the present staff hold out every promise that in the expanded facilities of the department, an effectual unit for work on these problems of reproduction will be realized.

The program for the training of academic personnel, supported by the Josiah Macy, Jr. Foundation, continues to play a most important role in the work and in the objectives of the department. Members of the resident staff now or formerly supported in whole or in part by the Macy Foundation grant includes the following: Drs. Wolfgang Tretter, Donald Christian, Robert Munsick, Jack Blechner and Theodore King. Consigned to laboratory work at present are Dr. John Sciarra in anatomy, Dr. Paul MacDonald in steroid chemistry, Dr. William T. Kelly in placental physiology, and Dr. Louis Bozzetti in pathology.

The effectiveness of this program seems to have been demonstrated by the appointment to full time assistant professorships in the last two years of five

former Macy fellows. Last July, the appointments included Dr. Karlis Adamsons (Columbia); Dr. Jaroslav Hulka (Pittsburgh) and Dr. William Little (Florida). Appointments to begin July 1, 1962 include Dr. Robert Munsick (Colorado) and Dr. Donald Christian (Florida).

For completeness, it may be noted that Drs. Leo Dunn and Walter Bonney, now Senior Residents, although never directly in the Macy program, have received similar appointments at the University of Iowa and at Vanderbilt University, respectively.

Graduate Program in Maternity Nursing

As a result of review by The State Education Department of The University of the State of New York in 1961, the graduate program in maternity nursing is now registered with the State as a program leading to the master of science degree. The State reviewing committee has also recommended that the desirability of increasing enrollment be considered.

An important step forward has been made in the program with the appointment of Professor Susan Williamson as Medical Director of the Graduate Program in Maternity Nursing. Professor Williamson has had wide experience with nurse-midwives as Attending Obstetrician on the staff of Maternity Center Association and as Obstetrician-in-Chief of American University Hospital in Beirut, Lebanon. Professor Williamson will guide the development of medical policies, clinical teaching and clinical experience for students, serve as consultant to faculty in overall curriculum development and assist in the interpretation of nurse-midwifery to professional staff.

Other changes in faculty this year include the appointment of Miss Jean Tease as Assistant Professor in charge of the program, replacing Miss Eunice Macdonald, and Miss Carmela Cavero as Associate in Nursing. Miss Cavero is a graduate of this program, receiving her M.S. degree in 1960. A full class of nine students enrolled in the program in September 1960 as candidates for the M.S. degree to be awarded in October 1962.

Preparation for Childbearing Classes

Three attending obstetricians, Dr. Marion Laird, Professor Equinn W. Munnell, and Professor Robert Hall have been appointed to serve with Miss Cavero, the parent education instructor, on a committee to advise concerning content and to evaluate the effectiveness of the program. This committee developed a questionnaire for patients which has been tested on a representative sample, revised, and will soon be ready for distribution to all future partici-

pants in the program. Residents have also participated in the teaching of selected classes.

From November 1, 1960 to September 15, 1961, 635 individuals have attended these classes. This includes 230 fathers. The above figures represent 12.1 percent of the total patients delivered. There were 2,817 individual patient sessions attended. Miss Gilda Davico was appointed supervisor-instructor in charge of parent education effective October 15, 1961.

Postgraduate Course in Obstetrics and Gynecology

Under the chairmanship of Professor Harold M. M. Tovell the first postgraduate course given by this department for specialists in obstetrics and gynecology was held during the week of December fourth to eighth. The course initially limited to fifty applicants was, because of the large number of applications received, increased to eighty registrants. It proved an extraordinary success, and offered testimony to the need and attraction of such an exercise to the many practicing obstetricians and gynecologists of the country.

Bulletin of The Sloane Hospital

The quarterly departmental bulletin, apparently the only one of its kind in the world, is entering its eighth year of publication. Besides enjoying a wide circulation in North America, it is circulated in twenty-five foreign countries and sixty copies are used by the Columbia Medical Library for exchange purposes. Two issues this year were devoted to a somewhat condensed version of the Transactions of The Annual Meeting of The Society of Sloane Hospital for Women. Other features included six short papers on "Works in Progress at Sloane Hospital" and two symposia "The Relaxation of the Pelvic Supports" and "The Indications for Cesarean Section."

Research

GENETICS

That the subject of genetics is closely related to that of human reproduction seems self evident, but it has rarely been possible in departments of obstetrics and gynecology to bring these concepts into close contact. For the last two years however, a division concerned with problems of genetics has been rapidly growing in this department under the direction of Professor Orlando J. Miller. He has been able, with limited space facilities, to begin a vigorous program and to assemble a small staff. During the last year he has had associated with him Dr. Horst

Naujoks, Bache Research Fellow, on leave from the University of Göttingen, and recently Dr. Barid B. Mukherjee. Further he has established a collaborative arrangement with Dr. W. Roy Breg, Assistant Medical Director of the Southbury Training School, and Clinical Instructor in Pediatrics at the Yale University School of Medicine.

Working with recently developed methods of chromosome analysis, Professor Miller and his group have confirmed the presence of satellites on up to ten of the acrocentric chromosomes and the presence of secondary constrictions on at least two and possibly as many as five other chromosome pairs. Another interesting finding in the laboratory has been that of an apparently normal individual who has XO/XY/XXY sex chromosome mosaicism, an observation not previously reported, and leading to the hypothesis that such individuals may either be infertile or have other clinical problems themselves or possibly that they are predisposed to the production of offspring with chromosomal abnormalities. Family concentrations of chromosomal abnormalities have been found repeatedly, usually involving the sex chromosomes and chromosome 21. Such abnormalities tend to involve individuals or families with mongolism, unilateral anorchism or Klinefelter's syndrome. Translocations involving chromosome 21 and one of the chromosomes in group 13-15 have been found in two of twelve mongols. Professor Miller is participating actively in the first year course in the medical school concerned with the introduction of the students to the principles of human genetics.

BIOCHEMISTRY OF THE REPRODUCTIVE PROCESS

The laboratory under the direction of Professors Seymour Lieberman and Raymond Vande Wiele continues its fundamental studies of the biochemistry and metabolism of the steroid hormones which evidently control so much of reproductive function.

Following the administration of the isotopically labelled aldosterone, the most important steroid hormone controlling the excretion of sodium and potassium to human subjects, about ten metabolites were recovered from the urine (Dr. William G. Kelly). Two of these were identified as aldosterone and tetrahydroaldosterone and two of the remainder are new compounds having the novel bicyclic acetal structure.

Dr. Achiel S. Hendriks has been measuring the secretory rate of aldosterone and hydrocortisone in normal subjects under basal conditions and following the administration of the pituitary hormone, ACTH. Following the administration of this pituitary

hormone, the secretory rates of these steroids are increased five to twenty-fold. Similar studies are being made in patients with the adrenogenital syndrome and Cushing's syndrome. Techniques have been developed for the measurement of the secretory rates of compound S, corticosterone and desoxycorticosterone, all of which are synthesized by the adrenals as intermediates in the biosynthesis of hydrocortisone or aldosterone.

Dr. Kenneth Roberts has completed a study which indicates that pregnanetriol, a normal constituent in human urine, may be derived from 17-hydroxy-pregnenolone and therefore need not arise only from the previously considered progenitor, 17 α -hydroxyprogesterone. This finding has important consequences for the understanding of the etiology of the symptoms commonly found in patients with congenital adrenal hyperplasia.

Dr. Erlio Gurpide has completed a mathematical analysis of the production and fate of the estrogens made by the placenta. This study has led to a clarification of previously obtained urinary estrogen levels and has permitted a more accurate estimation of the true secretory rate of estradiol in the third trimester of pregnancy.

Dr. Edouard Bolte has been studying the interrelationship between the secretory rate of dehydroisoandrosterone, the most abundant 17-ketosteroid secreted by the adrenals and the secretory rates of hydrocortisone and aldosterone, the two most important hormones made by this gland.

Dr. Paul MacDonald has been studying various aspects of the metabolism of dehydroisoandrosterone. He has demonstrated that the excretion of this 17-ketosteroid into the urine varies directly with the secretory rate of the dehydroisoandrosterone produced by the adrenal. In contrast, the excretion of androsterone and etiocholanolone, two major metabolites of dehydroisoandrosterone, is relatively independent of the secretory rate. These findings are important for true understanding of the use of the 17-ketosteroids as indices of adrenal, testicular and ovarian production.

Studies by Dr. MacDonald on patients with testicular feminization have demonstrated that the testes of such patients synthesized predominantly dehydroisoandrosterone, a weak androgen, and produce none of the potent androgens, such as androstenedione and testosterone. Thus the elevated 17-ketosteroids excreted in the urine, in no way reflect the androgenic stimulation to which these patients are subjected. Further studies have shown that the major C₁₉O₂ compound produced by the adrenals of children with congenital adrenal hyperplasia, is dehy-

droisoandrosterone. Studies carried out on adult patients with this disease have emphasized that any attempt to understand the biochemical abnormalities in some of these patients must take into account the possibility of derangement in the 3β -hydroxy-dehydrogenase system.

The nature of the androgens secreted by either the adrenals or the gonads of normal males and females, as well as female individuals with virilism, is being studied by Dr. MacDonald, by means of methods developed for the determination of the origin of the urinary C_{19} -11-desoxy steroids.

In the normal male the combined rate of secretion of androstenedione and testosterone by the testes has been found to be 2-3 mg per day. More surprising was the fact that after total suppression of the adrenal by the administration of decadron, there was a residual secretion of dehydroisoandrosterone of 5 mg in one individual and 4.8 mg in another. Since it was possible to decrease further this secretion of dehydroisoandrosterone by a testicular inhibitor, norlutin acetate, it seems possible that dehydroisoandrosterone is also a secretory product of the testes. This possibility has received further support because the administration of decadron to young female castrates reduced the adrenal secretion of dehydroisoandrosterone to less than 1 mg per day. Since this value is less than has ever been found in normal males or females, decadron apparently can eliminate adrenal secretion completely. By similar procedures, i.e. suppression of the adrenal by decadron and of the gonads by norlutin acetate, it was found that androstenedione and dehydroisoandrosterone were secreted by the ovary of normal females, although at levels much lower than were found for the testes.

An important and not infrequent disturbance in female reproductive physiology, called the Stein-Leventhal syndrome, manifests itself in gaining weight, disturbance of the menstrual cycle, development of abnormally distributed body hair and infertility. As a result of studies from this laboratory, at least two types of dysfunction appear to exist in patients with the Stein-Leventhal syndrome. In one type the abnormality appears to reside in the hypersecretion of dehydroisoandrosterone, whereas in the second type the abnormality seems to be an elevation of androstenedione and/or testosterone. In an attempt to classify the forms of virilization in the female, the type of studies noted above are being expanded to many clinical conditions in which virilism is the predominant feature.

ENDOCRINOLOGY AND INFERTILITY

Professor Anna Southam has been conducting a

number of investigations, largely concerned with the problems of fertility and infertility. With Dr. Shanti Shahani studies have been conducted on the incidence of sperm agglutination factors in the blood sera of infertile men and women. Although previous investigators have reported that antibodies to spermatozoa are present in the blood sera of some infertile males, the present investigation has already shown that such agglutinating substances, not yet identified as antibodies, are sometimes found in individuals who subsequently proved to be fertile.

The minimum amount of compound necessary to inhibit ovulation or to suppress menstruation has been studied by Professor Southam on a series of patients in the Sloane Endocrine Clinic. The recommended dose of 5 mg of norethynodrel with added estrogen consistently inhibited ovulation, but 2.5 mg failed to do so in about a quarter of the study group. Menstruation could be completely suppressed with only 15 mg of norethindrone acetate for at least nine months. These observations are of course important from a practical point of view in the control of conception, but also may be of value in the development of a method of treatment for women with endometriosis and perhaps for some disorders characterized by excessive menstruation. An interesting estrogen antagonist, clomiphene citrate, an analogue of chlorotrianisene is being studied because of its ability to produce indices of ovulation in amenorrheic women. With Dr. Stephen Wagensteen, Assistant Resident in Surgery, a clinical study is being conducted on the relationship of long term synthetic progestin therapy on gall bladder function.

In recent years there have been revolutionary revisions in the classification of congenital anomalies of the reproductive organs, which may be associated with abnormalities of menstruation and fertility. Studies of the chromosomes of individuals with such abnormalities have continued to reveal more abnormal complements. Most of the karyo type analyses, made by Professor Orlando J. Miller and his group, have been carried out on short term blood cultures, but long term cultures of skin and other tissues have also been used.

PHYSIOLOGY AND ABNORMALITIES OF PREGNANCY

Since it is apparent that the vital organs for the survival and normal development of the fetus is the placenta, much attention is being directed to its physiology. Particular concern has been given the physiologic mechanisms of transfer across the placenta of water, oxygen and carbon dioxide, electrolytes and the essential nutritive and excretory products.

In the laboratory of Professor Albert Plentl investigations on the placental transmission of isotopically labeled metabolites have been continued. Their purpose is to study the manner in which simple organic compounds traverse the placenta thus providing nutrients or building blocks which the fetus can use for growth. Isotopically labeled compounds are employed for this purpose, and, because of the hazards associated with radioactivity, rhesus monkeys are used as the experimental animal. The investigations on the transmission of amino acids initiated during the preceding year have been extended to include the basic amino acids, including histidine, lysine and arginine. Experiments on the transmission of histidine have been completed and quantitative estimates indicated an exceedingly rapid transfer from mother to fetus.

In similar manner the exchanges of urea, the metabolic end product of protein metabolism, have been investigated using labeled urea. Previous studies carried out in this laboratory indicated that this metabolic end product exchanges rapidly between the two organisms. Because of this rapidity quantitative estimates could not be made using a single isotope. To circumvent this difficulty the simultaneous transfers in opposite directions (from fetus to mother and mother to fetus) were estimated by using carbon-13 and carbon-14 labeled tracers. In this manner the net transfer of urea, which amounts to a fraction of the total placental exchange, could be measured which, incidentally, reflects the rate of protein catabolism of the fetus in utero.

Studies on the transfer of red blood cells across the primate placenta have been initiated. Since it is possible to obtain blood from the monkey fetus without interruptions of pregnancy, fetal blood cells were labeled with radioactive chromium and reinjected into the fetal circulation. The appearance of radioactive red cells in the maternal circulation would indicate that such a transfer had occurred, yet in eight such experiments no such evidence could be obtained.

Using Warburg respirometric technics, Professor Emanuel A. Friedman has continued to study the metabolism of the human placenta. In addition to attempting to correlate the levels of oxygen consumption of placental tissue with the precedent clinical course of the pregnancy, labor and fetal outcome, the investigations have been expanded to encompass variations in anaerobic metabolic processes, and histopathologic correlations. An interesting correlation has been determined to exist between the total oxygen uptake of a placenta and its functional ability to support its fetus.

The leucine aminopeptidase activity to be found

in maternal sera and in placental homogenates has been shown by Dr. John J. Sciarra to increase throughout pregnancy. Extremely high values were found in patients with twin pregnancies and very low values in patients with hydatidiform moles. These studies are now being extended to include similar examinations of aminopeptidase activities. With Professor Gilbert J. Vosburgh and Mr. Solan Chao, Dr. Sciarra has developed a spectrophotometric technique for the measurement of elastase inhibitor activity of human serum, for use in the study of normal and abnormal pregnancy.

LABOR AND DELIVERY

The graphicostatistical method of labor analysis devised by Professor Friedman, has been extensively applied to the study of abnormal patterns of labor. These investigations have included the study of the abnormally prolonged latent phase of the first stage of labor, of protracted active phase of cervical dilatation, of secondary arrest of labor and of certain abnormal patterns of dilation in the nullipara. In association with Dr. Lajos I. Von Micsky, Professor Friedman is continuing to work on the perfection of a method for the continuous electronic monitoring of cervical dilatation by means of the so-called "cervimeter." With Professor Plentl and Dr. Mary Jane Gray, formerly of this department and now Associate Professor of Obstetrics and Gynecology at the University of Vermont, Professor Friedman has completed an intensive study of the use of sparteine sulfate as an oxytocic agent for the induction and stimulation of labor. Characteristic of this substance is its relative safety as a mild uterine stimulant.

A brief reference under this heading must be made also to the work carried on by members of the Department of Anesthesiology, assigned to and working in the labor and delivery rooms of the Sloane Hospital, with patients under the clinical care of the Division of Obstetrics. These studies, chiefly concerned with the effects on mother and fetus of various anesthetic agents administered during labor have been carried on under the direction of Dr. Frank Moya, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist. The work of Dr. Moya and his group have been directed toward a variety of topics, including the following: the effect of various anesthetic agents on liver function, the use of the microhematocrit as an index of blood volume change due to hemorrhage, the relation of anesthesia to changes in acid-base balance in labor, the effects on maternal and fetal pH, $p\text{CO}_2$ and O_2 saturation and buffer base of low concentrations of cyclopropane and the cardiovascular effects of spinal

anesthesia in Cesarean section. The techniques and results of these experiments are described in greater detail in the section of the Department of Anesthesiology.

Aspects of the physiology of human lactation have continued to be examined by Professor Emanuel Friedman, with particular respect to milk production and breast engorgement during the puerperium. The effect of oxytocin on the actual supply of milk obtained by the nursing infant has been measured and it has been shown that the oxytocic hormone is effective in helping to initiate the milk supply, apparently by means of its "let-down" effect, and to attain peak productivity earlier. The ultimate level of production appears however to be uninfluenced.

Problems of the postpartum patient, due to coagulation defects or excessive fibrinolysis, remains an important subject for the department. In the laboratory of Dr. Louise Phillips a new substrate, benzoyl-arginine para nitroaniline, prepared by the Department of Biochemistry, for the determination of tryptic and fibrinolytic activity, has been investigated by Mr. Carlos Hendriquez, American Heart scholar.

Clinical aspects of the induction of labor are under study by Professors D. Anthony D'Esopo and David B. Moore. The difficulties encountered and the results obtained in breech deliveries are being analyzed by Professor Charles M. Steer and Dr. W. Duane Todd.

Erythroblastosis fetalis, a condition caused by the incompatibility of certain blood components of mother and fetus, represents a clearly defined problem in newborn pathology. A program developed by Dr. Vincent J. Freda is examining this problem from several directions. Inspired to some extent, by the observations made by Professor Taylor during his 1960 visit to the Royal Womens Hospital in Melbourne, Australia, Dr. Freda has established an Erythroblastosis Clinic. To this Clinic all pregnant women who are predisposed to the production of a child affected with hemolytic disease are referred. Clinical data derived from the observation of women during successive pregnancies will be of value in amplifying the clinical picture of the disease and will make possible the immediate application of any new means of therapy for the treatment of this condition. A program has already been established, with Dr. John Gorman, Associate in Pathology and Assistant Pathologist, to determine if it is possible to prevent the initial sensitization of the Rh negative mothers by the injection of high-titered Rh antisera in the third stage of labor. In addition Dr. Freda is testing the value of recent reports that the meas-

urement of pigments in samples of amniotic fluid obtained by amniocentesis in the last trimester of pregnancy may be of value in the prognosis for the fetus of isosensitized mothers and may be of use in deciding whether the early termination of pregnancy is indicated to save the possibly affected fetus.

In his laboratory, Dr. Freda has completed a study on the placental permeability in the human for the blood group isoantibodies. The saline acacia and hemolysin titers for anti-A and anti-B have been determined on maternal and cord sera in over 500 pregnancies. The isoantibodies traverse the placenta more readily when the mother is group O than when she is either group A or group B, and likewise more easily when she is subgroup A₂ than subgroup A₁.

The studies of Dr. Freda have revealed also that most cord sera contain complements or those components of complement necessary to effect lysis of sensitized red cells. The incidence of hemolytic isoantibody in the study group varied with the blood group of the individual. Approximately sixty-seven percent of group O mothers possessed hemolysins whereas only thirty-four percent of group A and thirty-two percent of group B mothers had them. When the hemolysins were present in the mother, the chances that the fetus would also have them were five to ten times as great when the mother was group O than when she was group A or group B. These findings are consistent with the knowledge that ABO hemolytic disease is virtually confined to babies with group O mothers.

FETUS AND NEWBORN

Studies of the physiologic changes, particularly of the cardiovascular and pulmonary systems, occurring immediately after delivery have been carried on in a laboratory devoted to this purpose, situated in immediate proximity to the delivery rooms, in the Sloane Hospital. This work has for several years been ably carried forward by Dr. L. Stanley James, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, and has resulted in a number of important contributions. To the team devoted to this work, has now been added Professor Karlis Adamsons, Jr. Professor Adamsons brings with him to this project several years of experience in the laboratories of Dr. Harry B. van Dyke, Professor of Pharmacology and Chairman of our Department, and of Professor Geoffrey Dawes of the Nuffield Institute, in Oxford. The work of the last year has continued to be concerned with studies of the cardiovascular system in particular relationship to the association of intracardiac shunts in the more acidotic

infants. This work has been described in more detail in the section on Anesthesiology.

Present interests of Professors James and Adamsons are now concentrating on O_2 consumption, CO_2 output and hydrogen ion excretion in the newborn. An apparatus is being developed which will permit minute to minute observation of O_2 consumption and CO_2 output with continuous monitoring of tidal air volume. Attention is being paid to the thermal environment. Correlated studies on animals are being conducted in an attempt to induce "the respiratory distress syndrome" by means of intra-uterine asphyxiation.

The effects of maternal medication by various analgesic agents during labor, on the clinical condition of the newborn infant, has been made by Dr. Shnider and Dr. Moya by means of a clinical review of 1,360 charts of obstetrical patients. The patients studied received various doses of meperidine hydrochloride, sodium seconal or phenothiazines, or else received no medication and were accepted as controls. The newborn's condition was evaluated by the "Apgar score" and by the T.S.R., i.e. the time required for sustained respiration. It was found that the time of administration of demerol before delivery is an important factor in determining its depressant effect on the newborn. Babies born of mothers who received the narcotic two to three hours before birth were more depressed than those who received the medication within a single hour or between three to four hours before birth.

The development of electrocardiography, for the continued observation of the condition of the baby, during labor, has been an objective of the department, particularly by Professor Steer. At present the principal difficulty is a technical one and modifications in existent apparatus appear to be essential for its satisfactory practical use. A joint effort by seven university medical schools to study the place of this instrument in clinical obstetrics is under consideration. In contradiction to some previous reports, Professor Steer in association with Dr. Josephine Wells, Associate Professor of Radiology and Attending Radiologist, found no apparent relationship between abdominal irradiation of the mother during pregnancy and the subsequent development of leukemia in the children. No statistical evidence could be found to contra-indicate the taking of x-rays in limited numbers whenever the clinical situation during pregnancy warranted it.

CANCER RESEARCH

The study of various biological and biochemical aspects of the common papillary cystadenocarci-

noma of the ovary has been continued. This tumor is used, partly because it can be obtained in relatively large quantities from the operating rooms and partly because it is known to occur in several forms, which vary in their degree of malignancy and which can be rather readily recognized by simple histological examination.

General cytochemical observations, based on preparations reacted for a number of different cellular enzymes, have been completed on a series of 117 ovarian tumors by Dr. Margaret Long. Definite correlations between such cytochemical reactions and the degrees of malignancy, have not been observed except with respect to the methyl green pyronin-y reaction for ribonucleic acid in the nucleolus.

In association with Lillian Adams, over forty ovarian carcinomas have been screened for their ability to grow and develop permanent cell lines in tissue culture. Using healthy tissue, a technique has been developed with which cells from about a quarter of the tumors tested can be established in permanent culture. These cells are being used, both for morphological studies, by Professor Harold M. M. Tovell and for cytochemical studies by Dr. Long. Preliminary chromosome analyses of the primary tumors and those grown in tissue culture indicate the probability of hyperdiploid modal values for certain tumors, possibly with a wider range of numbers and more morphological variations in the cultured tumors of grade III. Studies on the ascitic fluid from patients with ovarian carcinoma, carried out by Dr. Naujoks and Dr. Long, yielded cultures in which the mitotic figures consisted characteristically of forty-six chromosomes only.

The relationship between proteolytic enzyme activity and the degree of malignancy of human gynecologic tumors is under investigation, in the laboratory at the Francis Delafield Hospital, by Dr. Ines Mandl, Assistant Professor of Biochemistry, and Mr. Carlton Blackwood. Substrates which lend themselves to both biochemical and histochemical investigation were selected and quantitative biochemical procedures established to determine aminopeptidase and cathepsin activities of tumor homogenates. It was found that two peptidases and three cathepsins that were studied were more active and the proteolytic enzymes were inhibited less by the tumors with greater malignancy.

These proteolytic enzymes are also being examined on human gynecologic tumors maintained in rats and on the non-affected organs of the tumor-bearing animals. In collaboration with Professor Tovell, a method has been developed for the transplantation and maintenance of the tumors in x-ray

and cortisone conditioned rats. Liver, kidney and spleen homogenates of the animals showed considerably higher proteolytic activities and lower inhibitor concentrations than control animals. In collaboration with Professor Mandl's biochemical work, Dr. Long has been studying histochemically the sites of activity of aminopeptidases in gynecologic tumors. The localization has been found to be particularly in the stroma of the tumors which is perhaps somewhat contrary to the hypothesis that proteolytic enzymes of the tumor cells are directly concerned with their invasive characteristics.

The study of nucleoprotein synthesis in the interphase nucleus of dividing human ovarian tumor cells grown in tissue culture by Dr. Saul Bader has been pursued. The synthesis of the nucleic acids and protein in relation to the growth of the nucleus prior to cell division is being studied by autoradiography and cytophotometry. The incorporation of tritiated thymidine, cytidine, and histidine is being studied in relation to the rapid nuclear growth of the interphase tumor cell growing in tissue culture.

The radiobiologic study of cancer of the cervix has progressed under the immediate direction of Professor Saul B. Gusberg. In this work he has had the important assistance of Dr. Grace G. Herman, Dr. Ichiro Taki and Dr. Demetrios Yannopoulos. The clinical objective in these studies has been to find a method which might differentiate between those cancers of the cervix most suitably treated by radiation and those which are more effectively managed by surgical excision. To this end, a basic scientific program has been inaugurated. Micrometric measurements of cell nucleus and nucleolus before and after radiation in tumor cells and surrounding normal vaginal cells have already given insight into the comparative changes involved, and studies of fluorescence under ultraviolet light with acridine orange stain have been undertaken in an effort to demonstrate the changes in the nucleoprotein pattern following irradiation. Autoradiographic analysis and microspectrophotometric methods will be introduced into these quantitative studies shortly.

The chemotherapy of gynecologic neoplastic disease has been the particular interest of Professor Henry Clay Frick, II. With Professor Southam, and Dr. William Little, a former Resident and Macy Fellow, he has been studying the effect of massive doses of progesterone-like drugs, (hydroxyprogesterone caproate, and medoxyprogesterone acetate). The use of cyclophosphamide, "Cytosan," has been studied by Professor Frick on cases of carcinoma of the ovary, in association with Dr. John E. Ult-

mann, Associate in Medicine and Assistant Physician, and with Drs. Thorpe Kelly and Lowell Hughes, former Residents. Finally, Professor Frick has been working with Dr. Frederick P. Herter, Assistant Professor of Surgery and Associate Attending Surgeon, on the surgical problem of pelvic perfusion of advanced cancer of the female genital tract, using nitrogen mustard and combinations of other drugs.

A number of statistical studies, undertaken to evaluate methods of treatment, are also under way or have been completed. In collaboration with Dr. James A. Corscaden, former Clinical Professor of Obstetrics and Gynecology and Consultant, Professor Frick has prepared tables for inclusion in Volume 12 of the Annual Report on the Results of Treatment of Carcinoma of the Uterus, published in Stockholm under the sponsorship of the International Federation of Gynecology and Obstetrics, and is working on the cases of extremely early cancer of the cervix to determine their appropriate treatment. End results in cases of cancer of the vulva have been analyzed by Professors Tovell and Frick and Nikolas Janovski, Assistant Professor of Pathology (Obstetrics and Gynecology). In association with Professor Janovski, Professor Tovell has undertaken the study of all benign degenerative, premalignant and malignant disease of the vulva, in an attempt to develop a better classification and more practical diagnostic criteria for these poorly understood skin lesions of the vulva. To provide a critical control of the operation, usually performed for an obvious neoplasm, Professor D'Esopo has completed a study of the hysterectomies in this institution undertaken when the uterus is grossly normal and has defined the indications for this procedure.

GYNECOLOGY AND OBSTETRIC PATHOLOGY

During the last year, the direction of the activities of the laboratory devoted to obstetrical and gynecological pathology has been greatly improved. Organized as a division of the Department of Pathology of the Medical School, the laboratory is situated in close proximity to the wards and laboratories of the Department of Obstetrics. It is under the immediate supervision of Professor Janovski who devotes the majority of his time to the problems of obstetrics and gynecology but serves also to maintain a close connection between this work and that of pathology in general.

During the course of the year, the routine diagnosis of surgical specimen has been placed on a more systematic basis, with improved facilities for special histochemical techniques, photography and

records. The work of the residents has been given a more precise character and encouragement given to the writing of reports for publication. The teaching of the fourth year medical students has been considerably expanded.

Collaborative Study on Cerebral Palsy

The collaborative program is completing its fourth year of prospective investigations of factors which may affect the production of neurological and developmental disorders of children. Among the many factors which are being studied are those concerning genetic background, family health history, the gravida's own past health and illnesses, and her course during pregnancy, labor, and a delivery.

The obstetrical unit, under Professor Friedman, in his capacity as Obstetrical Coordinator and Assistant Project Director, and Dr. Freda, continues to give full support to the other units involved at the local level, including anesthesia, pediatrics and neurology, to other collaborating institutions, and to the central project offices at the National Institute of Neurological Diseases and Blindness of the United States Public Health Service. It is at the latter that all data gathered here and in the other fifteen institutions are being processed for subsequent analysis.

Fellows and Visitors

Beside the nine staff members associated with the Josiah Macy, Jr. Foundation fellowships, thirteen others are to be noted. With Professor Lieberman there have been six fellows: Dr. Edward Bolte from Universite de Montreal, Dr. Achille Hendriks from Universite de Louvain, Dr. William G. Kelly, Purdue University, Dr. Etienne-Emile Baulieu from Faculte de Medecine of the Universite de Paris, Dr. John G. Carpenter from University of London and Dr. Paula Zimmering from the Brooklyn Polytechnic Institute.

With Professor Southam there have been four fellows: Dr. Shanti Shahani from Bombay, India, Dr. Nuran Turksoy from Izmir, Turkey, Dr. Maurice Cohen from Manitoba, Canada, and Dr. Changiz Hamrang from Teheran, Iran.

With Professor Gusberg there have been two fellows: Dr. Ichiro Taki of Osaka University in Japan and Dr. Demetrios Yannopoulos of Salonika University in Greece. With Professor Orlando J. Miller there has been one fellow: Dr. Horst Naujoks of Gottingen, Germany.

During the course of the year there were eleven guest lecturers who have addressed the staff. Forty-

seven visitors from abroad, from twenty-three foreign countries, were recorded for the year. The countries sending the largest groups were Japan (8), Australia (7), England (5), and India (5). Among other distinguished visitors may be mentioned especially Sir Dugald Baird, Regius Professor at the University of Aberdeen, Professor Nicholas Louros of the University of Athens, and Professor Werner Bickenbach, Director of the First University Clinic in Munich.

Staff Activities

Among elections to various societies there may be noted the following: Professor Frick to the American Radium and the Harvey Societies; Professor Vosburgh to the New York Obstetrical Society. Professor Munnell to the American Association of Obstetricians and Gynecologists; Professor Taylor to Honorary Fellowship in the Society of Obstetricians and Gynecologists of Sweden. Professor Gusberg has been elected first Vice-President of New York Obstetrical Society and is Chairman of the Advisory Committee on Research and Therapy of the American Cancer Society. Professor Munnell has been elected Chairman for 1961-62 of the Section on Obstetrics and Gynecology of the New York Academy of Medicine. At the Third World Congress in Vienna in September, Professor Taylor was elected President of the International Federation of Obstetricians and Gynecologists for the term 1961-63.

On committees, Professor Lieberman is serving as Advisory Member of the Endocrine Study Section of the Public Health Service and of the Endocrinology Panel of the Cancer Chemotherapy National Service. Professors Taylor and Southam have been appointed to The Medical Committee of the Planned Parenthood Federation of America. Professor Miller has been invited to join the Editorial Board of a new journal to be entitled, "Cytogenetics." Professor Lieberman is a member of the Editorial Board of the Journal of Clinical Endocrinology and Metabolism and Professor Taylor continues to serve as Chief Editor of the American Journal of Obstetrics and Gynecology.

Travels by members of the department throughout the United States and abroad have been extensive during the last year. Some thirty-one lectures have been given before various societies and special audiences by members of the department. Professor Ines Mandl attended the Fifth International Congress of Biochemistry in Moscow in August; Professor Adamsons the First International Pharmacological Meeting in Stockholm, also in

August; and Professor Miller, the Second International Conference on Human Genetics in Rome in September. Ten members of the department attended the Third World Congress of Obstetrics and Gynecology held in Vienna in September, and at the sessions of the Congress, scientific papers were read by Professors Gusberg, Munnell and Friedman and Dr. Sciarra. The Annual Congress of the College of Obstetricians and Gynecologists held in Miami was attended by five members of the department, and the Congress of the American College of Surgeons in Chicago, by three. Professor Taylor served as a member of a committee meeting in Stockholm for the study of an international classification of the types of cancer of the ovary and Professor Frick made a visit to Japan, under a grant from the Population Council, for the purpose of studying methods of tubal sterilization.

The resignation of Dr. Alan Guttmacher, as Director of Obstetrical and Gynecological Service of Mount Sinai and as Clinical Professor of Obstetrics and Gynecology, will take place at the end of the current academic year. Dr. Guttmacher's appointment as President and Director of the Planned Parenthood Federation of America, has been announced.

Clinical Report

The number of deliveries performed annually in the hospital has shown a striking consistency during the last few years (Table 1). The figure of about three thousand annually seems about that which the ward service can efficiently handle. The available beds in both the private and semi-private categories, however, would permit the care of somewhat more patients in these categories. The movement of young families to the suburbs and the development of good community hospitals in these areas has tended throughout the city to reduce the demands for private obstetrical facilities.

There were four "maternal deaths". Three of these, however, resulted from complications of abortions in unregistered patients, admitted to the hospital already in a critical condition. The increase in the number of these patients seen in the hospital is perhaps due to an absolute increase in their occurrence, but perhaps also to a more liberal policy toward the admission of these difficult but

interesting cases. A single death among the 4,000 patients going to near term resulted from the unusual complication of massive gastric hemorrhage several days after cesarean section.

The fetal mortality figures (Table 3) were again low, both for the ward, 23.6 per thousand, and for the private service, 15.7 per thousand. That very many of these losses were related to prematurity is evident from Table 4. Of the 134 stillbirths or neonatal deaths, 45 occurred in infants weighing less than 1,000 grams and 84 less than 2,000 grams. As has been repeatedly pointed out one of the greatest problems in obstetrics is the prevention of premature delivery.

The number of gynecologic operations performed at the Presbyterian Hospital has also been constant at about the 2,000 figure for each of the last few years. As a part of the responsibility of the department there should perhaps also be noted the several hundred operations carried out annually on the gynecologic division at the Francis Delafield Hospital. The work being done in the treatment and the follow-up supervision of the cases of gynecologic cancer is demonstrated in Tables 7 and 8.

Acknowledgments

For very generous support of research in various fields thanks are due to the MacMillan fund of the Presbyterian Hospital, the Damon Runyon Memorial Fund for Cancer Research, the Association of the Aid for Crippled Children, the American Cancer Society, the United Cerebral Palsy Research and Educational Foundation, The Health Research Council of New York City, and the National Institutes of Health. Acknowledgment must also be made for a new gift from the Julius Schmid, Jr. Fund for the study of abnormal labor, to the Sandoz Pharmaceutical Company for studies of lactation and to a number of private donors.

A special expression of appreciation must be given to the Josiah Macy, Jr. Foundation for its continuing support of the program of fellowships for the further training of young obstetricians and gynecologists who wish careers in academic medicine. The support from this source has been an indispensable aid for the last five years in the development of the department's program.

TABLE 1
VIALE DELIVERIES

	<i>1948-1957 Average</i>	<i>1958</i>	<i>1959</i>	<i>1960</i>	<i>1961</i>
Ward	2,397	3,105	2,936	2,935	2,881
Semi-Private	781	763	796	727	730
Private	682	598	650	647	670
Total	3,860	4,466	4,382	4,309	4,281

TABLE 2
CLINIC VISITS

	<i>1957</i>	<i>1958</i>	<i>1959</i>	<i>1960</i>	<i>1961</i>
Obstetrical	24,781	27,369	25,071	24,610	26,438
Gynecological	16,793	16,888	17,459	18,132	17,339
Total	41,574	44,257	42,530	42,742	43,777

TABLE 3
FETAL MORTALITY

	<i>1948-1957 Average</i>	<i>1958</i>	<i>1959</i>	<i>1960</i>	<i>1961</i>
Ward	28.3/M	25.4/M	30.5/M	26.6/M	23.6/M
Private & Semi-Private	19.7/M	24.9/M	20.8/M	9.5/M	15.7/M

M — per thousand viable births.

TABLE 4
RELATION OF BIRTH WEIGHT TO PERINATAL MORTALITY

<i>Weight in Grams</i>	<i>Total Births</i>	<i>Total Stillbirths & Neonatal Deaths</i>	<i>Per Cent Perinatal Mortality</i>
500 - 1,000	45	45	100.
1,000 - 1,500	42	20	47.7
1,500 - 2,000	84	19	22.6
2,000 - 2,500	261	15	5.7
Over - 2,500	3,888	35	0.9

TABLE 5
OPERATIVE DELIVERIES

	<i>Ward</i>	<i>Private & Semi-Private</i>	<i>1960</i>	<i>1961</i>
Cesarean Sections	236	119	343	355
Primary	111	62	165	173
Repeat	125	57	178	182
Mid Forceps	45	44	122	89
Low Forceps	743	473	1,469	1,216
Breech	85	39	138	124

TABLE 6
GYNECOLOGIC OPERATIONS

	<i>1948-1957 Average</i>	<i>1958</i>	<i>1959</i>	<i>1960</i>	<i>1961</i>
Ward	842	900	878	977	1,004
Semi-Private	372	632	606	635	639
Private	515	406	463	456	421
Total	1,729	1,938	1,947	2,068	2,064

TABLE 7
CASES OF TREATED GYNECOLOGIC CANCER UNDER OBSERVATION
DURING EACH OF YEARS FROM 1956-1961

	<i>Total Patients Followed</i>	<i>The Presbyterian Ward Private</i>		<i>The Francis Delafield</i>
1956	1,827	799	643	385
1957	1,950	850	696	404
1958	1,883	853	612	418
1959	1,945	920	618	407
1960	2,248	1,084	696	468
1961	2,384	1,180	732	472

TABLE 8
FIVE-YEAR RESULTS IN PRIMARY WARD CASES OF GYNECOLOGIC CANCER
TREATED AT THE PRESBYTERIAN HOSPITAL, 1953-1955

	<i>1953</i>			<i>1954</i>			<i>1955</i>		
	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>	<i>Total No. of Cases</i>	<i>Number of Survivors</i>	<i>Percentage of Survivors</i>
Cancer of Cervix									
Uteri									
Totals	43	28	65	38	22	57	60	25	42
Stage I	24	20	83	27	17	63	17	13	76
Stage II	16	8	—	9	4	—	21	11	52
Stage III	1	0	—	1	1	—	15	1	—
Stage IV	2	0	—	1	0	—	7	0	—
Cancer of Corpus									
Uteri	45	22	49	28	19	67	21	9	43
Cancer of Ovary.....	15	9	60	24	10	41	28	5	18



Ophthalmology

A. GERARD DEVOE

Harkness Professor and Chairman of the Department • Director of Service

During the year 1961 there have been no major alterations in structure, policy or teaching assignments in the Department of Ophthalmology. Professor George K. Smelser continues to direct the training programs supported by the National Institutes of Health. The pre-doctoral program on medical cell biology has four students. Four individuals are currently working at the post-doctoral level. Although it is still too early to determine how effective these programs will be in stimulating interest in basic science as it relates to eye disease, this effort is considered a most important one.

The establishment of the Children's Eye Clinic under the sponsorship of the National Council to Combat Blindness has now been completed and is operating in a most satisfactory manner.

Departmental Statistics

The activity of the department and most of its subdivisions remains high. 27,271 visits were made by 7,629 out-patients to the Vanderbilt Clinic during the year. 3,194 patients were hospitalized for a total of 26,011 patient days. 3,003 operative procedures were carried out by the attending and resident staff.

The John M. Wheeler Library, the largest and most active strictly eye library in the country, has unfortunately lost the services of Miss Nora Lock, Librarian, who retired after twenty-four years of devoted service.

Our service diagnostic laboratories have maintained their usual activity. The X-ray department, directed by Professor Raymond L. Pfeiffer, has

performed 1,144 examinations on 743 patients. The presence of this unit, devoted exclusively to radiology of the eye and orbit, has been most helpful in making the department uniquely pre-eminent in a specialized field.

The surgical pathology laboratory under the direction of Professor Algernon B. Reese, has processed 195 globes and 352 biopsies. In this department, a resident teaching program in pathology is carried out under the guidance of Professor Joseph A. C. Wadsworth.

In the Microbiology and Clinical Pathological Diagnostic Laboratory of the Eye Institute, under the supervision of Dr. Devorah Locatcher-Khorazo, some 40,000 tests were carried out, a basic science course in bacteriology was given to the residents, and several epidemiological studies were performed for the Board of Health of New York City. In addition, studies were made on the relation of bacteriophage type to antibiotic sensitivity. The immunologic responses of staphylococcus aureus were investigated by the agar-gel diffusion technique. Further work is in progress directed towards the separation and identification of the individual antigens in staphylococcus aureus.

Under the guidance of Miss Sally Moore, assisted by Miss Terry Brook and Miss Jennifer Pritchard, the orthoptic department has completed its twelfth year of operation. Two students have completed their training and passed Board examinations. With the completion in March, 1961, of the Children's Eye Clinic, much of the activities of the orthoptic department was transferred to this new area where adequate space and equipment have made the handling of ocular muscle problems in children much more satisfactory.

Staff Activities

Professor Emeritus John H. Dunnington is a member of the Editorial Board of the Archives of Ophthalmology and a member of the Council of the American Academy of Ophthalmology and Otolaryngology. In association with Dr. Ellen F. Regan, he has continued his studies on ocular wound healing with particular reference to the effect of cautery in the production of fistulizing wound in glaucoma surgery. Professor Arthur Gerard DeVoc remains a member of the American Board of Ophthalmology, the Council of the American Ophthalmological Society, the Special Medical Advisory Group of the Veterans Administration, and the editorial staff of the AMA Archives of Ophthalmology. Professor Gordon M. Bruce, also a member of the Council of the American Ophthalmological Society, serves as

Consultant in Ophthalmology to the Surgeon General, United States Navy, and acted as Vice Chairman and member of the Executive Committee of the Section of Ophthalmology of the American Medical Association during the current year. Professor Reese was presented the Lucien Howe Medal for meritorious contributions to ophthalmology at the Ophthalmology Section of the American Medical Association Meeting this year. In addition he was guest of honor at the Section on Ophthalmology of the 43rd South African Medical Congress.

Professor Charles A. Perera spent several months at the Friends African Mission in Kaimosi, Kenya, East Africa, not only performing eye operations, but also assisting in the care of medical and surgical patients.

Professor Maynard C. Wheeler was Vice President of the American Academy of Ophthalmology and Otolaryngology during the current year.

Professor Smelser gave the Proctor Lecture at the annual meeting of the Association for Research in Ophthalmology on "Corneal Hydration, Comparative Physiology of Fish and Mammals" and gave the 18th Jackson Memorial Lecture, "Experimental Studies on Exophthalmos," at the annual meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago.

Professor Wadsworth is President this year of the Ophthalmic Pathology Club and serves as Secretary to the American Ophthalmological Society. Dr. Charles J. Campbell has been reappointed a member of the Armed Forces National Research Council Committee on Vision. Dr. Ira S. Jones has been elected Secretary-Treasurer of the New York State Ophthalmological Society and Vice President of the Pan-American Ophthalmological Foundation.

Research Activities

Working with Miss Victoria Ozanics, Professor Smelser has noted that corneal sulfated mucopolysaccharides in the developing rabbit cornea have an increased rate of synthesis accompanied by a normal rate of degradation.

A major interest of Professor Smelser has been the study of exophthalmos. Since there has been considerable evidence to indicate that an increase in connective tissue mucopolysaccharides is responsible for orbital edema in exophthalmos, this concept was tested experimentally by studying the distribution of such materials in various portions of the orbits of exophthalmic and control animals. Sulfated mucopolysaccharides were found to be essentially restricted to fibrous connective tissues in the orbit and not concentrated in edematous areas.

In a study of permeability of orbital vessels to isotopically labeled serum albumin, no striking differences were found in the control and exophthalmic animal.

Professor Smelser has noted that changes in the numbers of mast cells accompanied uveitis induced by intravitreal injection of foreign protein. It is known that cells of this type secrete material which affects the permeability of blood vessels, but their significance in large numbers in the inflamed iris remains obscure. In collaboration with Dr. Frank Polack, Professor Smelser has been studying the course of grafted corneal tissue by noting the fate of isotopically labeled endothelial cells, keratocytes, and corneal fibers. They are able to report that isotopically labeled tissues may be retained in normal corneas for at least ten months in the endothelium, sixteen months in the keratoblasts and five months in the collagen fibers.

The electron microscopy laboratory, the gift of Catherine and Henry Gaisman, has been active since January 1, 1961, and is directed by Dr. Toyoko Ishikawa. She is currently studying normal human ocular tissues obtained in surgery, the structure of the epithelium in aquatic cornea, the ciliary processes of normal and glaucomatous rabbits, and the development of cytological structures in certain retinal elements.

The major program in Professor Clifford V. Harding's laboratory consists of studies to further elucidate the mechanism of control of DNA synthesis and mitosis in normal and injured tissues. Pursuing his work of last year, which demonstrated a wave of stimulation to thymidine incorporation and mitosis in lens epithelium following mechanical injuries, Professor Harding's group has demonstrated the appearance of paired radioactive daughter nuclei indicating that the majority of cells which incorporate thymidine subsequently undergo division. He is currently attempting to obtain these reactions to injury in an *in vitro* system. Further observations on the retention of tritium by rabbit ocular tissues has shown the corneal and lens endothelium to retain tritium for periods of a year or more. To further the possibility of obtaining an *in vitro* system for this work, a study is being carried out in cold-blooded animals.

Professor Zacharias Dische's laboratory has continued investigations of the changes of ribonucleic acid of the lens during aging and cataract formation. The distribution of RNA between different particulate and soluble fractions of proteins in lenses of six day to one year old rabbits was determined and found similar to that previously described in rats.

Experiments were also carried out on changes in the distribution of ribonucleic acid in rat lenses after X-ray radiation. In collaboration with Dr. Leslie Robert of the Department of Biochemistry of the Medical School of the University of Pennsylvania, the glycoproteins of the beef and rabbit corneas and their distribution among various collagen fractions and the ground substance of the cornea were studied.

In the microbiology and immunology section under the direction of Professor Seymour P. Halbert, the biochemical evolution of lens proteins throughout the vertebrate scale has been examined in some detail, in collaboration with Dr. W. Manski. Attempts to separate the lens components involved have been begun with a view to analysis of the biochemical structure of cross-reacting proteins from species widely separated in the evolutionary scale. In collaboration with Dr. Gabriele Ehrlich, the composition of rabbit cornea and rabbit heart has been analyzed using immunological methods with anti-sera prepared in ducks. It was found that the anti-cornea sera showed surprising specificity in their cytotoxic activity on freshly grown rabbit tissue culture cells, these being cytotoxic for rabbit corneal epithelium and endothelium, but not for corneal stroma fibroblasts. In another study, various anti-lens sera have been tested against rabbit lens epithelium grown in tissue cultures. The data to date suggest that cytotoxic effects of anti-lens sera are probably not involved in the pathogenesis of phacogenic uveitis. Dr. William Cooper, a member of the resident staff, has begun an analysis of the composition of bovine and human vitreous. Using immunological methods, he demonstrated that bovine vitreous contains a large number of serum proteins. It was shown that human vitreous, as well as bovine, contains six to seven specific components not shared by other human tissues. A start has been made to use anti-human vitreous antibodies as a tool for analyzing the composition of retinal detachment fluid. It is hoped that such analysis will give some clue to the source of this subretinal fluid and thereby an indication of the pathogenesis of retinal detachment. In studies with Professor DeVoe and Dr. Anthony Donn, anti-sera have been prepared against human cornea. These rabbit anti-human sera are being used as controls in immunological studies related to possible detection of antibody response to donor corneal grafts in human beings receiving corneal transplantation.

Continuing his analysis of human streptococcal infections, Professor Halbert has developed a working hypothesis implicating streptolysin "O" in the pathogenesis of rheumatic fever. Immuno-electro-

phoretic analysis of sera of patients with rheumatic fever has indicated that rheumatic patients are apparently hyper immune with regard to streptococcal extracellular products. Certain anti-serotonin drugs have shown a significant protective effect on the acute lethal toxicity of streptolysin "O."

Dr. Emil Wirostko, a member of the resident staff, has begun a study on the effect of certain anti-metabolites and other agents which inhibit antibody formation on the development of allergic uveitis. Preliminary experimentation suggests that six mercapto-purine may be partially effective in preventing uveitis due to bovine serum albumin.

Professor Robert M. Day, ophthalmic consultant to the Thyroid Clinic, has continued studies with killifish, confirming the presence of a factor in normal human serum which binds the substance responsible for the production of exophthalmos. Further studies are under way in an attempt to identify the "binding factor."

Dr. Walter Spelsberg of the resident staff has spent six months studying electron microscopy with Dr. George B. Chapman at the Rockefeller Institute. Their study concerns the ultra structure of the trabecula and Schlemm's canal in the human and rhesus monkey eye.

The Pupillography Laboratory, under the guidance of Drs. Otto Lowenstein and Irene Loewenfeld, has been active in both experimental and clinical work.

Dr. Charles J. Campbell, assisted by Miss Catherine Rittler in the Physiological Optics Laboratory, is studying retinal disease from the functional point of view. Dr. Floyd Farrant has studied patients in a Retinal Vascular Clinic and is able to determine objectively extremely early changes in the retinal blood vessels. In conjunction with Dr. Charles J. Koester of the Research Division of the American Optical Company, the staff has developed, and is using experimentally, the ruby laser for photocoagulation of the retina.

Under the direction of Professor Reese, assisted by Drs. Robert M. Ellsworth and Ira S. Jones, the Retinoblastoma Clinic has had an extremely active year. This unique clinic, which saw 780 patients during the last year, has probably had a wider experience with retinoblastoma and other intraocular diseases of childhood and infancy than any other group in the world. It continues to receive patients from all sections of the country.

Professor George R. Merriam, Jr. directs the radiotherapy division. Phantom measurements on the dose of radiation to the lens from diagnostic x-ray have been made. Studies on the chemical

changes in the lens of animals induced by radiation are being carried out in collaboration with Professor Dische and experiments on the relative biological effectiveness of various qualities of radiation for the production of cataracts has proceeded with Dr. Harald H. Rossi, Professor of Radiology (Physics). Since many of these animals are followed for two years, progress is slow.

Dr. Donn, in collaboration with Dr. Nicholas P. Christy, Assistant Professor of Medicine and Assistant Attending Physician, and Mr. Martin Rosenblatt, a third year medical student, has studied the effects of aldosterone on the active transport of sodium across the rabbit cornea. In collaboration with Dr. Gordon I. Kaye, Research Associate in Anatomy, and Dr. George D. Pappas, Assistant Professor of Anatomy, and Mrs. Nancy Mallett, the presence of pinocytosis in the rabbit corneal endothelium has been demonstrated with the electron microscope. Working with Dr. Stanley Miller and Mrs. Mallett, he is studying the movement of water across the living cornea. Using tritiated water they have shown that there is no net flux of water across living rabbit cornea in vitro. They have shown that movement of water across the cornea can be accounted for by diffusion without bulk flow. The major part of the cornea's resistance to water lies in the stroma. In Dr. Donn's laboratory, Dr. Robert Peterson, a United States Public Health Service Fellow, is using both chemical and histochemical means to study the presence of acetylcholinesterase in the various structures of the cornea, attempting to confirm the reported high concentration of acetylcholine in the epithelium.

Professor Bruce, in collaboration with Dr. Carolyn Denning, Associate in Pediatrics and Assistant Attending Pediatrician, is observing the ocular disturbances occurring in cystic fibrosis of the pancreas. With Professor Wadsworth, he has been able to confirm pathologically the papilledema and hemorrhage which have been observed clinically.

The Glaucoma Clinic, under the direction of Dr. Andrew de Roeth Jr., is carrying out a long-range evaluation project in tonography. A new electronic applanation tonometer has been acquired and is being evaluated to determine its proper role in tonometry. Dr. de Roeth, assisted by Dr. Yen Fen Pei, has demonstrated that the retinas of diabetic rats treated with insulin and some of the oral anti-diabetic drugs manifest a metabolic pattern seen in the normal retina.

Retinal detachment studies have been actively pursued under the direction of Professor Graham Clark. Aided by the support of the Rosenwald

Family Fund and with the help of the Rev. Mr. Randall C. Mason, preliminary studies have been begun in the psychologic factors in delayed wound healing. An algesiometer has been built, normal controls have been run, and the patients are now being routinely tested preoperatively and at the time of discharge.

The surgical technique of subscleral diathermy incorporating the use of silicone rubber foam implants for the treatment of retinal detachments has been perfected and a report of 210 cases has been prepared. The choroidal thermophore for the treatment of retinal detachment without the use of high frequency currents has been designed and built in prototype. Animal experimentation to establish the optimum heat requirements are in process. Dr. Robert Collier of the resident staff is carrying out experimental work on the retinal and scleral effects of local occlusion of the choroidal circulation.

Professor Clark has been active in working out administrative and legal details to simplify the removal of eyes at autopsy. This will insure for the first time an adequate supply of eye tissue for transplantation surgery and research studies.

The Corneal Clinic led by Dr. Donn and Professor DeVoe is becoming increasingly active. Dr. Cardona's work with plastic keratoprosthesis devices has passed through a year of successful experimental animal work and is now being employed in patients whose eyes are hopelessly blind from corneal scarring and vascularization. Immediate results have been most gratifying, although it will be some years before any sort of permanent evaluation can be established. Experimental surgical approaches to such blinding and refractory conditions as endothelial dystrophy and bullous keratopathy are in progress.

The Optic Nerve Clinic, under the direction of Professor Frank D. Carroll, has completed its first full year of existence and is becoming a focal point for the study of certain neuro-ophthalmological abnormalities.

An ophthalmic plastic surgery group composed of Professors Wadsworth, Merriam, and DeVoe has been formed and is trying to redevelop this phase of ophthalmic surgery in which at one time the In-

stitute of Ophthalmology was the acknowledged leader. In recent years interest in this subspecialty has declined.

The Muscle Clinic, now incorporated into the Children's Eye Clinic, supervised by Professor Maynard C. Wheeler and Dr. Philip Knapp, has recently been joined by Dr. Hugh M. Moss, a former resident, who has completed six months of a Heed Fellowship, during which he studied exclusively ocular myology at centers throughout the country where outstanding students of these problems are working.

As in previous years, the department has profited by visitors from many institutions both here and abroad. This year our visitors have come from Denmark, East Africa, England, Formosa, Germany, Istanbul, Japan, New Zealand, Peru and Scotland.

Generous contributions to the work of the department have again come from numerous sources. We are most appreciative to these individuals, not only for their financial help, but for the stimulus they provide to our entire group. We would like to express particular gratitude to: Mr. Sol Alexander, Mrs. Brooks Astor, Mr. and Mrs. W. H. Beattie, Henry M. Blackmer Foundation, Mrs. W. Blair, Mrs. George Brewster, Mr. and Mrs. A. C. Brush, Robert Sterling Clark Foundation, Marie Hey Clemens Fund, Mr. and Mrs. Henry J. Gaisman, Gleich Foundation, Mr. Edward Goldey, Pauline Gordon Foundation, Mary W. Harriman Fund, Mr. L. Bob Hope, Rev. Arthur M. Hughes, Jack Kreindler Foundation, Life Insurance Medical Research Fund, Mortimer and Harriet Marcus Foundation, Mrs. Hubert Martineau, Mr. and Mrs. G. Morfit, Rev. Sylvester Michael, Dunlevy Milbank Foundation, National Council to Combat Blindness, Inc., National Society for the Prevention of Blindness, New York Foundation, Inc., New York Heart Association, Mrs. M. Roth, Alfred P. Sloan Foundation, Inc., Seth Sprague Educational and Charitable Fund, Snyder Ophthalmic Foundation, Dr. Jules Stein, John Jay and Eliza Jane Watson Foundation, Whitehall Foundation, Mr. and Mrs. H. C. Wildner, Mr. Charles T. Wilson, W. J. Wollman Foundation, and the United States Public Health Service.



Orthopaedic Surgery

FRANK E. STINCHFIELD

*Professor and
Chairman of the Department
Director of Service*

The ward census on the Orthopaedic Service has been maintained at almost one hundred percent capacity.

In our report of 1960 attention was drawn to the fact that we desired some facility by which the trauma load could be enlarged for training of our residents in the field of major trauma. In August, 1961 a program of mutual assistance between Harlem Hospital and The New York Orthopaedic Hospital was formed. At the present time, all residents rotate through the Trauma Service at Harlem Hospital and attending orthopaedic surgeons from The New York Orthopaedic Hospital have been assigned on a rotating basis to Harlem Hospital and, in return, residents and attending surgeons from Harlem Hospital attend rounds and conferences at The New York Orthopaedic Hospital. To date, this arrangement has worked out to the mutual benefit of both institutions, and for the first time we feel that we are now in a position to have our residents see and care for severe major trauma.

For the year 1961 there were 2,973 patients admitted to The New York Orthopaedic Hospital and

2,262 operative procedures were performed.

<i>Classification</i>	<i>Number of Patients</i>
Back	255
Upper extremity	721
Lower extremity	738
Hip	298
Knee	200
Unclassified	50

There were 37,511 patient visits to the Orthopaedic and Fracture Clinics during 1961.

Research

The activities of our research department under the direction of Professor C. Andrew L. Bassett continue to increase. Several significant advances in our understanding of bone physiology have been made by Dr. Irwin Clark, Associate Professor of Biochemistry, assigned to Orthopaedic Surgery. Tissue culture and animal studies have continued to define factors responsible for bone formation. These have demonstrated that certain primitive connective tissue cells are responsive to their environment and

will produce bone, cartilage or fibrous tissue depending upon oxygen concentration and compression factors. High oxygen and compaction favors bone formation while low oxygen and compaction results in cartilage. When tension is substituted for compaction, fibrous tissue results. In a collaborative study with Dr. J. Harkin of the Hospital for Special Surgery, certain features of the early phases of bone formation in tissue culture have been studied with the electron microscope.

During the past year, the facilities of the bone bank have been used to preserve, in addition to bone, human nerves and dura for transplantation. These tissues are procured from suitable autopsy cases and frozen and sterilized by cathode radiation in the same manner as the bone grafts. An average of 750 to 900 pieces of banked bone have been used on 250 to 300 patients during the past several years.

In an attempt to increase the supply of banked bone and to develop a material that could be universally available to orthopaedic surgeons, a process has been devised in collaboration with E. R. Squibb and Sons to remove fats and the antigenic proteins of calf bone. The subsequent material is freeze-dried, packed in a bottle under vacuum, and stored at room temperature until ready for use. An experimental evaluation of cortical grafts of this heterogenous bone has shown that they are accepted by the host. On the basis of this study, a broad clinical evaluation of the material has been undertaken. Initial observations of the behavior of these processed grafts in humans tend to support the experimental findings. It is conceivable that the material may some day substitute for the preserved bone homograft.

Professor Bassett has continued his studies on the regeneration of nerves with Dr. James B. Campbell, Associate Professor of Neurological Surgery and Assistant Attending Neurological Surgeon. During the past year, the main emphasis has been on determining the limits of nerve homografting in large animals. Gaps up to 7 cm long in the sciatic nerves in large dogs have been successfully bridged by grafts protected by Millipore. Further applications of the Millipore tubulation techniques in man have been made to shield "end to end" suture lines, to protect homografts, and to prevent neural regeneration by "caps" of the material. In the feline spinal cord, large numbers of functionally competent axons have been demonstrated crossing the transection site. However, no change in the paraplegic state of over 300 animals has been observed. Currently, an investigation of methods for preventing collateral sprouting of inter-nuncials is in progress.

Professor Clark has continued his studies on the removal of radiostrontium: the use of magnesium ion, which has been shown to be effective in increasing the elimination of strontium-89 from rats, regardless of whether the isotope was administered 48 hours or 30 days before, is being studied further. It is hoped to ascertain the mechanism whereby it increases the overall excretion of radiostrontium although decreasing fecal excretion, the role of this element on calcium and phosphorus metabolism in general, and whether the use of this substance is practical in man.

Professor Clark is studying the effects of parathyroid and adrenal hormones on the excretion and absorption of calcium and phosphorus using radioactive calcium and phosphorus and the effects of these hormones on the intestinal secretion of calcium and phosphorus. Professor Clark presented papers at the Fifth International Congress of Biochemistry in Moscow on metabolic alterations in hypervitaminotic D rats fed vitamin A.

Dr. John P. Jones, Jr. has investigated the effect of adding cortical "match sticks" and ground cancellous bone grafts to a fracture site. Results to date show that the "match sticks" increase the strength of eight week old callus by a factor of 2.5 to 3 times over the controls. At four weeks, fractured femurs, grafted with the cortical slivers, are as strong or stronger than the ungrafted controls at eight weeks.

Mr. John Gregory, a second year medical student, spent the summer in the laboratories studying the production of heat by various saws and drills in human and animal bone. He has established that a temperature rise in excess of 25° C., routinely observed with many sawing techniques, kills cell and denatures proteins.

Staff Activities

Professor Harrison L. McLaughlin continues his interest in the field of the surgery of trauma. Professor George B. Ambrose presented an exhibit on slipped upper femoral epiphysis at the 1961 meeting of the American Academy of Orthopaedic Surgeons. Dr. David L. Andrews is studying the biomechanics and evolution of the hip joint, and its relationship to reconstructive hip surgery. Dr. C. Zent Garber, Associate Professor of Pathology and Associate Attending Orthopedic Pathologist, is studying the precipitation of calcium phosphates under conditions relating to bone formation. Professor Alexander Garcia, Jr. is continuing studies on coxa vara with Professor Charles T. Ryder, Jr., and on fractures of the hip with Professor Charles S. Neer, II, and Professor Ambrose.

Professor Ryder has devoted his major interest to congenital dislocation of the hip in children and has done considerable work with Dr. John K. Lattimer, Professor of Urology and Director of the Service, on the functional repair of exstrophy of the bladder. Professor Neer continues his studies of fractures of the neck of the femur and tumors of bones. He is also investigating the problem of the atmospheric pressure in bone cysts. Professor Sawnie R. Gaston is analyzing material from talipes equinovarus deformities in children. Professor D. Keith McElroy has conducted studies on iliac artery obstruction simulating herniation of the nucleus pulposus and on echinococcosis of bone for publication in the near future.

Dr. James N. Worcester, Jr., a member of our staff since January 1, 1961, is studying the development of scoliosis in the experimental animal. He is also analyzing the percent of antibiotics found in wound hematomas when preoperative antibiotics have been administered. Dr. Worcester is in charge of the bone tumor service of The New York Orthopaedic Hospital, replacing Dr. Kenneth C. Francis who is now director of the bone tumor service at Memorial Hospital for Cancer and Allied Diseases.

The orthopaedic hand clinic continues under the able direction of Professor Robert E. Carroll. During the year 799 patients were seen, 276 of whom were admitted for surgery.

Professor Frederick S. Craig has continued his studies on the plantar flexed talus and on leg lengthening in unilateral growth deficiency.

Professor Everett C. Bragg, with Dr. Meyer Alpert, Assistant Professor of Radiology and Assistant Attending Radiologist, has continued a study of lumbar discs through discograms, anatomical dissection and photography. He is conducting studies in the treatment of the clubfoot and fractures of the forearm.

Professor Emeritus Alan DeForest Smith and Professor William H. von Lackum, although having retired from active teaching and work, have continued to contribute their valuable time to the teaching of undergraduate students. We are, indeed, indebted to them for this.

The resident staff has continued to show an active interest in various research projects. Dr. Richard L. Cruess, in conjunction with the Department of Neurological Surgery, is reviewing cases of herniated nucleus pulposus treated at the Medical Center by operation, with and without spinal fusion. Dr. Norman A. Hill, with Professor McLaughlin, is conducting a study of posterior dislocations of the shoulder. Dr. Ralph C. Marcove, with Dr. Meyer

Alpert, Assistant Professor of Radiology and Assistant Attending Radiologist, is analyzing cases of benign osteoblastoma. Dr. James W. G. Murray, with Professor Stinchfield, is studying diaphyseal fractures of both bones of the forearm in adults. Dr. Thomas M. Stiles is reviewing the effect of debridement and the use of antibiotics on eventual infection in open fracture. Dr. Theodore R. Waugh, with Dr. Merle H. Katzman, is studying the use of Surgicel to prevent bone healing. An analysis of cases of scoliosis treated by post-operative correction is being made by Dr. Waugh and Dr. J. William Fielding of St. Luke's Hospital. Dr. Frank C. Wilson, Jr. is reviewing triple arthrodesis cases to determine the incidence of pseudarthrosis and its relationship to such factors as length of plaster immobilization, time of weight bearing, initial deformity, infection, and use of internal fixation. In addition, in conjunction with Dr. Worcester, he is investigating prophylactic antibiotics in the prevention of wound sepsis.

Honors and Offices

Professor McLaughlin completed his year as President of the American Association of Trauma. He was elected an honorary member of the American Orthopaedic Association. Professor McLaughlin received an honorary Doctor of Law degree from Queen's University, Kingston, Ontario. Professor Bassett was elected Secretary-Treasurer of The Orthopaedic Research Society. Professor Garcia was elected Chairman of the New York and Brooklyn Regional Committee on Trauma.

Professor Stinchfield is President-Elect of the American Academy of Orthopaedic Surgeons. He served as Visiting Professor at the University of California at Los Angeles School of Medicine for two weeks in April 1961 and delivered the Samuel Higby Camp Lecture.

Teaching

Our conviction concerning the teaching of students in small groups by an instructor devoting full time to this responsibility has been well justified. The results of teaching groups of seven to eight third year students by a single instructor for two weeks have been most satisfying. Teaching at the resident level has remained the same as in previous years. One of the most important facets of our training program for residents is our "follow-up" clinic which is held weekly. 2,571 patients were seen and examined in this clinic in 1961. Only by such careful evaluation of the results of treatment is it possible for residents to develop mature judgment.

The sixth annual postgraduate course was offered

from November 13 through 17 and was attended by 60 students from the United States and Canada. Each successive year this course has become more popular. This course is designed for specialists in orthopaedic surgery and surveys musculoskeletal diseases and injuries.

A two-month course in the basic science is offered twice a year for our residents and the residents from six non-affiliated hospitals. The number of non-affiliated hospitals enrolling residents in this course is increasing at each session.

Fifty-six residents from the metropolitan area, as well as from Connecticut, Delaware, New Jersey, New York, Pennsylvania and the District of Columbia, attended the third annual orthopaedic residents' seminar. The program presented by members of the resident and attending staff of The New York Orthopaedic Hospital was well received.

Other Activities

Dr. J. Vernon Luck, Director of Los Angeles Orthopaedic Hospital and President of the American Academy of Orthopedic Surgeons, was Visiting Professor at The New York Orthopaedic Hospital for one week. Dr. Luck assumed the directorship of the service, conducted seminars and conferences and individual interviews with residents and various members of the staff. Dr. Luck was extremely stimulating and presented a new approach to many problems. The plan of having a visiting professor each year will be continued and Dr. Otto E. Aufranc of Boston, Massachusetts, has accepted for 1962.

In mid-October, the Interurban Orthopaedic Club met in New York and a one-day program was presented at The New York Orthopaedic Hospital by members of the various departments of the Medical Center. The meeting was attended by thirty club members.

The Bulletin of The New York Orthopaedic Hospital, under the able directorship of Professor Hallock, with the assistance of Professors Neer and Ryder, is greatly appreciated by the alumni and the staff.

Staff Changes

On December 31, 1960, Professor J. William Fielding resigned to devote his entire time to his obligations at St. Luke's Hospital. Upon completion of his residency training program here, Dr. Andrews was appointed Assistant Attending Orthopedic Surgeon and Instructor in Orthopedic Surgery. Dr. Merle H. Katzman, a recent graduate of our training program, has been appointed Assistant Attending Orthopedic Surgeon in Vanderbilt Clinic. Professor Bassett was promoted from Assistant to Associate Professor of Orthopedic Surgery in charge of orthopaedic research. Professor Craig was promoted from Assistant to Associate Professor of Clinical Orthopedic Surgery.

Acknowledgments

Our alumni have remained most loyal and we were delighted to have seventy-four return for alumni day. We are very grateful to the Women's Auxiliary for the efforts they have expended in the children's service. The New York Orthopaedic Hospital is indebted to the general financial support of Mr. and Mrs. J. Spencer Love, Mr. Arthur H. Lamborn, Mr. Charles S. Munson, Mr. William Bourne, Mr. and Mrs. Frank Smith, Mr. DeWitt Wallace, the Sidney J. Weinberg Foundation, Mrs. Bernard E. Smith and the late Mr. Smith, the Easter Seal Research Foundation, The Squibb Institute for Medical Research, the Merrill Trust Fund, the United States Atomic Energy Commission, and the United States Public Health Service.



Otolaryngology

EDMUND P. FOWLER, JR.

Professor and Chairman of the Department · Director of Service

During the year 1961 Dr. John D. Kernan, Professor of Otolaryngology, Chairman of the Department and Director of the Service from 1935-47, and acting director many times under Dr. Cornelius Coakley, died. Dr. Kernan was internationally known for his endoscopy, his work on cancer of the larynx, and his forthright discussions on all branches of otolaryngology. He was a great clinician and a wise teacher of great humility and understanding. His colleagues, his many students and his patients are greatly saddened by his death.

Professor DeGraaf Woodman has retired and here again we have suffered a great loss. Professor Woodman was endowed with superior skills in all branches of otolaryngology. He invented several operations not only for the larynx but also opera-

tions on the ear. During 1961 Professor Woodman served as President of the New York Bronchoscopic Society.

The staff has been augmented by three young men who finished their residencies in Presbyterian Hospital during the year. These were Drs. Lawrence Savetsky, Malcolm Schvey and David Zenker.

Professor Franz Altmann is making an extensive study of pathology of the temporal bone. He has continued his work with Professors Jules Waltner and Dr. Milos Basek and Dr. Vladimir Epanchin on the use of ultrasound for the alleviation of the symptoms of Meniere's disease and continued his studies on otosclerosis and otic malformations.

Professor John J. Conley has instituted an instruction course for head and neck surgeons under

the direction of Professor Joseph Goldman of Mount Sinai Hospital. Professor Conley was made Chairman of the Eastern Section of the Trilological Society and a member of the editorial board of the American Medical Association Archives of Otolaryngology. He continues his investigations on statistical data on sarcomas, melanomas and neurogenous tumors of the head and neck.

Professor Daniel C. Baker Jr. continues his studies of the transantral sphenoidal approach for removal of the pituitary in patients with advanced glandular carcinoma. He completed, with Dr. Pilar Carbajal and the Department of Radiology, a study on the use of contrast media in diseases of the larynx. He served as a member of the American Board of Otolaryngology and Residency Review Committee for the American Medical Association and the Advisory Committee for Otolaryngology of the American College of Surgeons. Professor Baker is continuing his investigations on the use of corticosteroids for allergic rhinitis and on the laryngeal problems of singers.

Professor Milos Basek has completed his studies on anomalies of the facial nerve and has continued his research on the instrumentation and effects of ultrasound on the labyrinth not only of animals but also human beings with Meniere's disease.

Professor Edmund P. Fowler Jr. was made an Honorary Fellow of the Royal College of Surgeons in Ireland. He has been working on a number of projects, including microcirculation with the assistance of three medical students, W. Frank, M. Gilbert, and E. Turvey. It was ascertained that there was little or no effect on the peripheral circulation of hamsters with the inhalation of negative or positive ions from the air. This team also found that hyperventilation slowed and "sludged" small blood vessel circulation while CO₂ improved it, especially in the presence of hypothermia. Professor Fowler with Dr. Raymond Strauss has been working on the newer methods for the diagnosis of acoustic tumors and with Dr. Zenker and Dr. Stuart W. Cosgriff, Assistant Professor of Clinical Medicine and Assistant Attending Physician, has continued studies on intravascular changes in Meniere's disease, sudden deafness, and Bell's palsy. He has also been working with Mrs. Shulamith Kastein on the differential diagnosis of dysacusic children. Mrs. Kastein, Supervisor of the Lester Hofheimer Speech and Hearing Clinic, is a member of the Rehabilitation Codes Committee, member of the Collaborative Study of Child Development of the National Institutes of Health, member of the Board of Coopera-

tive Educational Services of Westchester County, and a member of the Professional Conference on Identification and Learning Problems of the Minimal Brain Damaged Child.

Professor Bela Marquit attended the International Congress of Otolaryngology in Paris, where he reported on his studies of the use of irradiated bank cartilage in plastic surgery of the nose. He is continuing his research on the behavior of irradiated cartilage, but now the emphasis is on the middle ear in collaboration with Professors Altmann and Basek.

Dr. Lawrence Savetsky has completed his study on *Aspergillus* in the maxillary sinus and continues in charge of the irradiated cartilage program. He completed his basic work on the structure of the lateral semicircular canal in man as an aid to study the experimental effects of ultrasonic radiation of the labyrinth. He is reviewing non-chromaffin granulomas of the middle ear with Professor Waltner.

Dr. Schvey has been keeping human and animal ossicles "alive" in tissue culture with a view to studying the basic factors in bone and cartilage growth in vitro. He has also been engaged in electrical studies of Bell's palsy and with the Haskins Laboratories he is working with the structure patterns of articulation.

Dr. Stanley Whitfield, with the help of Dr. Wilfred Copenhaver, Professor of Anatomy, has continued his attempts to produce congenital anomalies by interference with the blood supply to the head of amblystoma.

Dr. Zenker with Professor Fowler continued his studies on the effects of nicotinic acid and of intravenous procaine on the circulation of the stria vascularis of the guinea pig and finds a marked effect on the white thrombi and some effect on the speed of flow although there is little effect on the caliber of the vessels.

There has been a decrease in the number of patients seen in Vanderbilt Clinic from 7,752 to 6,752. There were 1,824 admissions to Presbyterian Hospital and 191 to Harkness Pavilion, with a total of 1,663 operations. There were 1,046 admissions to the E.N.T. division of the Babies Hospital and 621 operations. There were 740 consultations on the other services of the Columbia-Presbyterian Medical Center.

Financial assistance is gratefully acknowledged from the Deafness Research Foundation, the Philip Hanson Hiss Jr. Memorial Fund, the Central Bureau of the American Otological Society and, above all, the United States Public Health Service.



Pathology

DONALD G. MCKAY

Delafield Professor and Chairman of the Department · Director of Service

The department has been greatly strengthened by the advent of Dr. Jacob Furth as Professor of Pathology and Pathologist to the Francis Delafield Hospital. He is one of the country's leading pathologists in research on cancer and has been President of the American Association for Cancer Research and President of the American Society of Experimental Pathology.

Dr. Nikolas Janovski was appointed Assistant Professor of Pathology and is the acting pathologist for the Department of Obstetrics and Gynecology and the Sloane Hospital. Dr. Alvin Volkman received an American Cancer Society Fellowship and has taken a leave of absence for a year of research under Professor Howard Florey at Oxford University. Dr. Nathan Lanc is on sabbatical leave and is spending

six months with Dr. Gabriel Godman, Associate Professor of Microbiology. He is doing research on cancer by use of electron microscopy.

Our teaching program has been greatly improved by the addition of several new part time staff members. These include: Drs. Raymond Gambino, Reba Goodman, Untac Kim, Bernard Messier, Hisayo Nakai, Lucien Rubenstein, Bruce Sells, Herbert Stoeck, Hiroyuki Takemoto, Neville Wolff and Kenji Yokoro.

The department acknowledges with gratitude the many years of outstanding service of Professor Edith Sproul and offers her its best wishes in her new positions as Professor of Pathology at the University of Buffalo Medical School and the Roswell Park Memorial Institute.

The year was saddened by the sudden death of Dr. Monroe Birns who served on our part-time staff. Dr. Birns was an enthusiastic and well loved teacher whose great research potential cannot now be realized. His death leaves a gap in our ranks that will not easily be filled.

Residency Training

The addition of five positions to our House Staff has allowed the development of a complete residency training. The program is flexible but consists of five basic years of training. The first year is devoted primarily to autopsy work with some surgical pathology experience and is divided into two six-month periods, one at the Presbyterian Hospital under Professor Donald G. McKay and Professor David Spiro, and one at the Delafield Hospital under Professor Furth. The second year is devoted to surgical pathology under Professor Raffaele Lattes. The third year is spent in the pathology specialties, with six months of pediatric pathology under Professor Dorothy Andersen, three months of obstetric and gynecologic pathology under Professor Janovski, and three months of neuropathology under Professor Abner Wolf.

The two-year program in clinical pathology is under the general direction of Dr. John G. Gorman, who is assisted by Professors Raymond Gambino, Donald E. Brown, Stanley R. Opler, and Daniel W. Benninghoff.

The United States Public Health Service has given the department support for a training program in pathology. Dr. Lewis Glasser and Dr. Jacob Turner are the first trainees to participate in this program which is designed to train future research workers and teachers of pathology.

Medical Student Teaching

Several changes have been made in the second year course in pathology. Each student now participates once during the course in the performance of an autopsy at either the Presbyterian Hospital or the Francis Delafield Hospital. An intensive exposure to gross pathology is given with demonstrations by members of our staff of gross specimens in every laboratory period.

An additional feature of the laboratory period is the rotation of our students in groups of ten to the Mount Sinai Hospital and the Montefiore Hospital. Professors Hans Popper and Harry M. Zimmerman are in charge of these sessions during which clinical-pathologic correlation is stressed.

A varied program of special work is under way under the direction of Drs. Richard Pachter, Joseph

Wiener, Stanley S. Simbonis and Myron E. Tracht. Some of the students will present theses at the end of the year, others will review the literature of a special subject, others will report on their own research and still others will study cases in the autopsy files.

Several of our students elected pathology training for their summer elective this year. Some worked in Professor G. Payling-Wright's laboratory in London, one in Dr. Stanley Hartroft's laboratory at Washington University in St. Louis, one in Dr. Henry Moon's laboratory in San Francisco, and others at the Gorgas Hospital in the Canal Zone, St. George's Hospital, London, our own laboratory, and the Delafield Hospital.

Renovation

We are greatly indebted to the Health Research Council of the City of New York for support to establish an electron microscope laboratory in the department. This laboratory, under the direction of Professor Spiro, will house three electron microscopes and the ancillary laboratories necessary for research with these instruments.

Also, through the generosity of the Health Research Council, a laboratory for Trainees and Residents and a photography laboratory are being provided. These should be completed by January, 1962.

Honors

Professor Arthur Purdy Stout was made an Honorary Fellow of the American Society of Clinical Pathologists and an Honorary Member of the Rudolf Virchow Medical Society. Professor Lester Cahn was given the degree of Doctor of Science, *honoris causa*, by the University of Leeds, England. He also was made a Fellow of the Royal Society of Medicine, of London, and was appointed Consultant to the Assistant Surgeon General and Chief of the Dental Corps, United States Army. Professor Cahn gave the Frank C. Wilkinson commemorative lecture at the University of Manchester, England, and a lecture to the Royal Society of Medicine, London. He also visited Australia and New Zealand, giving lectures in Hobart, Launceston, Melbourne, Perth, Adelaide, and Sidney.

Professor Zimmerman visited Japan and gave lectures at a symposium under the auspices of the Japanese Neurosurgical Society and at Tokyo University, Kyoto University, and Osaka University Schools of Medicine. Professor Leon Roizin is President-Elect of the American Association of Neuropathologists. He gave lectures at the New York Academy of Sciences, the Fifth Congress of the International Acad-

emy of Legal Medicine and Social Medicine in Vienna, and the World Congress of Psychiatry in Montreal. Professor David Cowen was elected President of the American Association of Neuropathology. Professor Paul J. Anderson became Assistant Editor of the Journal of Neuropathology and Experimental Neurology.

Professor Wolf was Visiting Professor of Neuropathology at the Louisiana State University Medical School and became Associate Editor of the Journal of Neuropathology and Experimental Neurology. He was made Vice-Chairman of the Scientific Research Advisory Board, National Association for Retarded Children, and a member of the United Cerebral Palsy Research Advisory Committee. He continues as a member of the Board of Councillors of the National Institute of Neurological Diseases and Blindness, of the United States Public Health Service and as a member of the Council of the American Association of Neuropathologists.

Dr. Gorman gave a lecture at the University of Melbourne, Australia, in February. Professor McKay became a member of the Royal Society of Medicine, London, and gave lectures at the First International Conference on Congenital Malformations in London and at the First Pan-American Congress of Biology and Experimental Pathology held in Caracas, Venezuela. While there, he was made an honorary member of the Venezuelan Society of Obstetricians and Gynecologists.

Professor Lattes was a guest lecturer for one week in the Department of Pathology of the University of Puerto Rico School of Medicine and School of Tropical Medicine in the spring. Professor Popper gave lectures at various foreign universities, including Tokyo, Kyoto, Tohoku, Seoul, and Hong Kong. He was a Special Consultant to the Surgeon General on a trip to Japan and Korea to the Far East Command of the United States Army.

General Pathology Division

Drs. William Margaretten and Hisayo Nakai have investigated the pathogenesis of bilateral renal cortical necrosis in rabbits by one injection of staphylococcal toxin. They have shown that the staphylococcal toxin acts by producing spasm and necrosis of small arteries and arterioles in the kidney and that the staphylococcal toxin acts differently than gram negative bacterial endotoxin in producing bilateral renal cortical necrosis. In another set of experiments they have shown that bacterial endotoxin from *Pseudomonas aeruginosa* is capable of crossing the blood brain barrier, since they could elicit the generalized Shwartzman reaction in prepared rabbits by

injecting the endotoxin intrathecally. They are now investigating the role of renal vasospasm in the process of "preparation" for the generalized Shwartzman reaction.

Professor Spiro investigated several disease processes by electron microscopy. In a study of experimental nephrosis induced by administration of aminonucleoside, he has shown that there are destructive lesions of the basement membrane of the glomerular capillaries analogous to those that have already been demonstrated in renal biopsies from human patients with the nephrotic syndrome. This serves as further evidence that damage to the basement membrane is the probable structural basis for proteinuria. In another study, after administration of amino acids, the mechanisms of formation of hyaline droplets within the proximal convoluted tubule cells and the apparent transport of these hyaline droplets to the peritubular capillaries was shown to be similar to the same process which occurs in humans with the nephrotic syndrome during protein reabsorption by the kidney. In a study of bone taken from biopsies of patients and from experimental animals, the ultrastructure of the various cells within osseous tissue was described. This study suggests that bone resorption (in the vicinity of osteoclasts) involves primarily a depolymerization of the collagen fibers with subsequent secondary mobilization of hydroxyapatite. The fine structure of normal mammalian cardiac muscle was extensively studied. The heart muscle myofibrils were shown to be composed of two sets of interdigitating filaments comparable to those of striated skeletal muscle. Professor Spiro also investigated a model segmental demyelinating process utilizing experimental diphtheritic neuritis as the model. The fine structural details of myelin breakdown, which in its earliest phases are limited to certain regions of the Schwann cell, particularly the mesaxone, were described.

Professor Simbonis is working on the biosynthesis of proteins in cell free systems from mammalian and bacterial sources, with special emphasis on the "transfer enzyme" and conditions affecting protein specificity. This work includes an attempt to isolate and characterize bacterial ribonuclease with special reference to the effect of homologous and heterologous DNA preparations on its activity.

Dr. Wiener is studying the ultrastructure of experimental thrombi in veins.

Professor Tracht has utilized the isolated perfused rat liver to study the metabolic response of this organ to various forms of toxic injury. The work thus far indicates that agents producing morphologically different types of injury seem to have their influence

through a common pathway involving failure of the liver to increase its energy output in response to metabolic demands. The energy available is apparently reapportioned among the various metabolic functions of the liver cells.

Dr. Hans Kaunitz has studied the effects of medium and long-chain saturated triglycerides in the diet on a variety of disease processes. In conjunction with Dr. Roberts Rugh, Associate Professor of Radiology (Biology), it was shown that medium chain triglycerides were more effective in prolonging the life of rats exposed to multiple doses of x-irradiation than long-chain triglycerides. In conjunction with Dr. Beatrice C. Seegal, Professor of Microbiology, Dr. Kaunitz is studying the effects of dietary lipid on experimental nephritis in rats. It was found that lipid nephrosis was less pronounced in the group fed medium-chain triglycerides. Gas-liquid and thin layer chromatographic studies were also carried out on the lipids of serum, kidney, liver and depot fat. The work thus far indicates that the fat deposited in nephrosis is strongly influenced by the dietary fat. Studies are also in progress concerning the biological properties of oxidized fats.

Professor Henry S. Simms has continued his studies of fat deposition in atherosclerosis. Professor Simms and Dr. Benjamin N. Berg are engaged in studies on the longevity of rats in relation to the age of onset of major diseases. The studies indicate the existence of a controlling factor which affects the age of onset of many endogenous diseases, and which appears to play an important role in regulating life span.

Professor McKay has demonstrated that the generalized Schwartzman reaction can be produced in pregnant rats by dietary means in the absence of injection of exogenous bacterial endotoxin. In conjunction with Dr. Kaunitz, it has been demonstrated that the toxic factor or factors can be concentrated by molecular distillation of oxidized cod liver oil into one fraction. The use of absorbable and non-absorbable antibiotics in the diet reduced the incidence of the disease by four times. Pathological studies of the placenta have revealed a series of changes that include premature separation of the placenta, intrauterine hemorrhage, infarction and congestion and degeneration of the placental trophoblast. The interest in this animal experiment centers around the possibility that this controlled experiment in animals may lead to an understanding of toxemia of pregnancy in the human.

Professor Robert Hirsch has continued his studies on atherosclerosis and lipid metabolism with various members of the Department of Medicine of the Co-

lumbia Division at the Goldwater Hospital. These will be described elsewhere in this report. In conjunction with Professor McKay, he has demonstrated that bacterial endotoxin causes a profound alteration in serum lipids in experimental animals.

Surgical Pathology Division

Professor Lattes has continued his study of thymomas in conjunction with Dr. Pachter. Professor Stout has continued his studies of mesenchymal tumors. He has also worked with Drs. Oscar Auerbach and Lawrence Garfinkel of the Veterans Administration Hospital in East Orange, and Dr. E. Cuyler Hammond of the American Cancer Society, on a study of the relationship of cigarette smoking to cancer of the lung. This study has concentrated on the mucosa of the bronchial tree and adds strong support to the hypothesis that there is an etiological relationship between cigarette smoking and cancer of the lung. Professor Stout is also studying the mechanism of the carcinogenic effect of implanted plastics upon the surrounding connective tissue in experimental animals. Professor Luciano Ozzello is studying the production of acid mucopolysaccharides by stromal fibroblasts of human breast cancer in conjunction with Professor Margaret Murray, Professor of Anatomy. He is also studying the behavior *in vitro* of various human neoplasms. Among the tumors cultured, a giant cell carcinoma of the lung exhibited cultural characteristics which proved the heretofore questionable epithelial origin of this neoplasm.

Pediatric Pathology Division

Professor Andersen has continued her studies of cystic fibrosis. This year has seen progress in studies of pulmonary function and treatment of respiratory infections in early stages by antibiotic and physiotherapy and in later stages by positive pressure breathing and several forms of assisted respiration. Professor Blanc has studied a number of prepubertal cases of seminiferous tubule dysgenesis. Several hundred sections of new-born testis have been examined for sex chromatin and the earliest case of seminiferous tubule dysgenesis detected. The observations indicate that the syndrome is not due to lack of migration of primitive germ cells to the gonad as had previously been thought. Professor Blanc has studied the anatomy of jejuno-ileal atresias in the human and in experimental animals and has concluded that this congenital malformation is due to a "surgical" accident in the fetus. Among the many studies of fetal and neonatal pathology that Professor Blanc has carried out he has found evidence of an associa-

tion between intrauterine pulmonary hypertension and the size of the ductus arteriosus.

Neuropathology Division

Professors Wolf, Cowen, and their associates in the neuropathology laboratories have continued their studies of the etiology and consequences of perinatal brain damage and other aspects of the pathophysiology of the nervous system. A description of their studies is contained in the report of the Chairman of the Department of Neurology.

Professor Roizin is conducting a wide variety of studies related to the central nervous system. Electron microscope, cytologic and histochemical techniques have been applied to 16 biopsies of the basal ganglia and cerebral cortex in Parkinson's disease and dyskinesias subjected to pallidal surgery. These studies appear to indicate the existence of some histogenous and related histochemical factors which possibly may play an important role in the pathogenesis of the disease processes. This work is being carried out by Professor Roizin, Dr. Edgar M. Housepian, Associate in Neurological Surgery, and Dr. J. Lawrence Pool, Professor of Neurological Surgery and Director of the Neurological Surgery Service.

Studies have revealed that in Tay-Sachs disease, neurons located outside the cerebrospinal system (submucosal and myenteric plexi, retina) show degenerative changes similar to those of the central nervous system. A study of rectal biopsies in patients affected by neurolipoidoses has been initiated by Professor Roizin with the cooperation of Drs. M. Slade and H. Hermida of the Brooklyn Veterans Administration Hospital. Correlated histologic, histochemical and electron microscope studies are in the course of study also with the purpose of determining whether such procedures could be useful for diagnostic differentiation of neurolipoidoses. Though no control biopsy material is available, some morphologic, histochemical and electron microscope findings in a case of hereditary cerebromacular degeneration appear similar to those described in some neurolipoidoses.

Professors Roizin and Mavis Kaufman and Dr. Richard Orcs, Trainee in Anatomy, are collaborating with Professor Rugh of the Department of Radiology in the study of the central nervous system of embryos exposed to intrauterine irradiation with 150 r. at 8.5 and 9.5 g.d. Up to date neuropathologic and electron microscopic findings indicated that penetrating x-irradiation when applied at a given time during gestation produces a wide variety of abnormalities in members of the same litter. In the

central nervous system, these ranged from severe malformations such as exencephaly to undersized brains in which the histologic and some histochemical features do not show remarkable deviations from the control rats. Some of these individual variations may have a genetic component.

Studies are being conducted on experimental allergic encephalomyelitis produced with brain fractions. These fractions were obtained by differential centrifugation. Eleven of fifteen guinea pigs developed encephalomyelitic symptoms which were also verified histologically. The rest of the animals showed only some general reactions. In the controls, of fifteen animals injected with liver mitochondria, six showed some general reactions but none neurological symptoms. Additional studies with mitochondrial fractions showed contamination with some myelin fragments and some debris of nervous tissue. Therefore, new attempts are being made to obtain purer fractions. Also nuclear fractions are under study. These investigations are being carried out by Professor Roizin, Dr. Hirokazu Asao, Research Fellow (Psychiatry), and Dr. Magdalena Berger-Wechsler.

Acute and short-term experiments with Prochlorperazine (Compazine S.K.F.) are being performed.

a) *Distribution in tissues:* In studies of the *in vitro* uptake of Compazine, after incubation in saline with glucose containing 10-300 μ M Compazine at 37°C. for one hour, rat cortex slices were found to concentrate the drug up to forty times the initial amount. By use of *in vivo* experiments, chemical estimations in resting state indicate that the drug accumulates in the liver to the greatest extent after two hours, then in descending order, cerebral cortex, kidney, cerebellum, basal ganglia, cervical cord, brain stem and lumbar cord. Highest quantities of Compazine, following intramuscular injection with 0.5 mg./100 gm.b.w., were found in the liver (80 μ g/g.) after two weeks, then in descending order, brain stem, kidney, cervical cord, cerebellum, lung, lumbar cord, basal ganglia, cerebral cortex. After six weeks the levels were either unchanged or lower in most cases; exceptions were basal ganglia, where the amount had nearly doubled, and cerebral cortex and lung which showed small increases. Chronic experiments will be continued for three, six and twelve months respectively.

b) *Histometabolic studies:* resting rates of oxygen consumption by rat brain slices were inhibited by 2 μ M Compazine. The increased respiration of brain slices with addition of 10 μ M was inhibited fifty percent and seventy percent by 100 μ M Compazine. These concentrations had no effect on resting respiration. The effects of Compazine on the increased respiration of electrically stimulated brain

slices are being investigated. These studies are carried out by Professor Roizin, Drs. Brenda M. Bollard and W. G. Bruce Casselman and Mr. Edward Robinson, and supported in part by Parkinson's Disease Foundation. c) *Prochlorperazine labelled with S³⁵ (Ethanedisulfate)*: preliminary studies were carried out on rats, cats and monkeys with Compazine S³⁵ for the purpose of standardizing I.V. procedures for administration of radioactive substances and their respective controls; obtaining samples of blood, spinal fluid and urine at various intervals of time, and estimation of concentration of radioactivity in tissue homogenates of various anatomotopographic areas of the central nervous tissues as well as various organs and body tissues. Concomitantly frozen and paraffin embedded sections were used for histoautoradiographic investigations. These research studies were carried out by Dr. Harvey C. Stancer, Assistant Resident in Psychiatry, in collaboration with Professor Roizin, Drs. Bollard and Casselman, and Mr. Robinson. Compazine S³⁵ has been supplied by Smith, Kline and French Laboratories. d) *Histologic studies*: To date sixty-nine animals have been processed through various technical procedures and the microscope findings are in course of evaluation. These studies are being carried by Professors Roizin and Kaufman and Dr. Bruno Miles. e) *Chronic experiments*: Two groups of animals have been injected subcutaneously for three months. These experiments will be completed by July, 1962. Up to the time of this report, the treatment is well tolerated by the rats and only four have died because of lower respiratory infection. These studies are being carried out by Professors Roizin and Kaufman and Drs. Miles, Ores and Asao. These investigations have been supported in part by the Parkinson's Disease Foundation and Smith Kline and French Laboratories.

Clinical Pathology Division

Dr. Gorman developed an improved method for testing individuals for red cell glucose-6-phosphate dehydrogenase deficiency. Dr. Gorman and Dr. James G. Chandler, Assistant Resident in Surgery, have been engaged in developing a new theoretical model of immunological tolerance. This is based on the concept that at certain times injection of antigen may induce a cellular immunological response or "clone" composed not of plasma cells but rather of "immunologically incompetent" cells. These postulated cells, although they respond by replication to specific antigenic stimulus, do not make circulating antibody. However, by their ability to compete with and to displace immunologically competent cells against the same antigen, they can render the indi-

vidual immunologically tolerant to that particular antigen.

Obstetrical and Gynecologic Pathology Division

Professor Janovski is engaged in studies of the relation of the structure of the placenta to maternal disease; of neoplasms of the cervix and ovary, and of degenerative and neoplastic diseases of the vulva.

Oral Pathology Division

In addition to histochemical studies of diseases of the mucus membrane of the oropharynx, Professor Cahn and Dr. Melvin Blake are engaged in a study of these tissues in the living patient by use of an epillumination microscope (Auflichtmikroskop). This new and promising instrument allows the pathologist to obtain a microscopic view of tissues in the living patient and will allow certain studies of the development of neoplasms that cannot be obtained in any other way.

Francis Delafield Hospital Division

Professor Sproul continued to study the kidneys at autopsy on patients with and without hypercalcemia and malignant disease. Using the common fixatives a great discrepancy had been noted between the amount of calcium recognizable by histochemical means and the known functional disturbance and calcium content by chemical means.

Professor Sproul, Dr. Sidney Werner, Associate Professor of Clinical Medicine and Associate Attending Physician, and Dr. Raul Grinberg, Research Associate in Medicine, have studied several of Professor Furth's mouse thyrotropic pituitary tumors, comparing the behavior of the dependent tumor, an autonomous responsive tumor and an autonomous unresponsive tumor. Another series of experiments compared the effect of thyroxin on these three thyrotropic tumors growing in thyroidectomized mice given colchicine.

Professor Sproul and Dr. Grinberg have investigated the possible relationship of thyroid secretion to lymphoid and reticulum cell hyperplasias and sarcomas in the mouse. Transplantation of thyroid tissue into the spleen sometimes results in marked hyperplasias of lymphoid tissue there and in other organs.

Lymphomas of several types and sites of origin have also been observed with passage of some pituitary thyrotropic tumors. These include large cystic neck masses, and tumors in mediastinum, lung, retroperitoneum and spleen with small nodules elsewhere.

Experiments are being carried out to elucidate the circumstances under which these develop.

Professors Sproul and Stout continued a survey of prostate tissue submitted from the twelve medical centers who have joined the Study Group of Prostate Cancer Chemotherapy. Professor Sproul reviewed the effectiveness of heated nebulized hypertonic saline and propylene glycol to induce a productive cough yielding diagnostic cytologic material.

Professor Henry A. Azar conducted a study of the distribution of various forms of cancer among the main socio-economic, religious and ethnic groups in Lebanon and the Near East. This study is based on material accumulated at the American University of Beirut Hospital, Beirut, Lebanon. His observations indicate that the incidence of malignant lymphomas appears to be considerably higher in Lebanon and neighboring Arab Near Eastern countries than in the United States and Western Europe. A comparison between the three main religious groups in Lebanon (Moslems, Armenians, and Christians other than Armenians) shows that the relative frequency of carcinoma of the uterine cervix was significantly lower among Moslem women. The relative frequency of carcinoma of the stomach was considerably higher among Armenian men and women. The proportion of private (high economic group) patients in the group of carcinoma of the breast was higher than in any other form of cancer in both males and females. There was a significant association in males between tobacco smoking and carcinoma of the lung, larynx, buccal cavity and pharynx.

Another study, started in Beirut, deals with an endemic focus of skeletal fluorosis due to chronic fluoride intoxication. This focus is located in the Sheikhdum of Quatar on the Persian Gulf where the fluoride concentration in drinking water ranges between 0.80 to 3.45 parts per million. The fluoride content of defatted and ashed rib samples obtained from two Qatari patients with generalized osteosclerosis ranged between 0.843 and 1.052 percent (normal controls 0.038 to 0.041 percent). It is postulated that certain local factors, such as hot climate and excessive drinking of tea, may contribute to the severity of fluorosis. Tea leaves constitute probably the richest source of fluoride among the various foods and beverages consumed by man.

Dr. Kaity Yannopoulos has engaged in a study of smooth muscle tumors in sixty children. Interesting is the different behavior of the leiomyosarcomas in different locations. Those of the prostate and urinary bladder are very malignant. The gastric cases tend to local extension and are often of large size, but of relatively benign clinical course. In the other areas,

they are clinically benign in spite of malignant histological appearance and often large size.

Dr. Yannopoulos has also studied the development of a fibrosarcoma in the bone of a patient who had fibrous dysplasia for many years, in addition to continuing her study of prostatic carcinoma in conjunction with Professors Stout and Sproul.

Montefiore Hospital

Professor Harry Zimmerman continued investigations of experimentally induced brain tumors. It has been demonstrated, through cerebellar tumors resulting from chemical carcinogenic stimulation in mice, that the medulloblastoma is not a glioma, as formerly rather generally believed, but a neuroblastoma. This tumor originates in the ganglion cells of the granular layer of the cerebellar cortex. It is sometimes a mixed tumor in that astrocytes may also proliferate to contribute to its cellular composition. The concept, therefore, that the hypothetical "medulloblast" is a bipotential cell is no longer valid.

A new study is underway on cerebral edema and swelling as determined by electron microscopy.

With the collaboration of Dr. Lucie Adelsberger, studies on the immunochemistry of human tumor suspensions have continued. This work indicates that malignant neoplasms alter erythrocyte agglutination and hemolysis. The work now is directed towards defining the chemical fractions which account for these phenomena. The ultimate aim is to devise an immunological test for detection of early malignancy.

The main research by Professor Theodore Spaet has been investigation of the means whereby blood remains fluid in the living organism. He previously demonstrated that blood thromboplastin is rapidly removed from circulation by cells of the reticulo-endothelial system. He seeks to determine whether blood coagulation product I, an earlier intermediate, is cleared by a similar mechanism.

Professor Spaet also is interested in the mechanism whereby platelets adhere to damaged vascular endothelium. He is attempting to evaluate the hypothesis that such adhesion depends upon electrostatic charge phenomena whereby negatively charged platelets adhere to positively charged connective tissue fibers which have been laid bare in the course of injury. A positively charged polymer, Polybrene — 2400, appears to interfere with the ability of platelets to participate in this reaction.

During the past year a clinical study was completed which demonstrated that epsilon-aminocaproic acid (EACA), an inhibitor of fibrinolysis was strongly effective in reducing the post-operative bleeding following suprapubic prostatectomy.

St. Luke's Hospital

Professor Charles F. Begg and Dr. Artemis D. Nash are studying the problems of neonatal gastric perforations, the levels of adrenal corticosteroids in the blood in the Waterhouse-Friederichsen syndrome, and of melanomas of the meninges.

Mount Sinai Hospital

Professor Popper and his associates are studying the acute and chronic response of the liver to injury by coordinated light microscopic, electron microscopic, histochemical and biochemical procedures which include chemical pathology and cytochemistry. Recently, autoradiography and immunologic techniques were also applied.

Cellular factors in fiber formation were studied; in view of a constant ratio between hydroxyproline (characteristic of collagen) and DNA in a variety of different conditions, a close relation between fiber formation and cell proliferation was assumed. Similarly, cellular factors were held responsible for fiber disappearance. Cell counts and radioautographic studies implicated both bile ductular and mesenchymal cells. An effect of steroids on these cells was demonstrated.

Immunologic studies dealt with the formation of gamma globulin in hepatic mesenchymal cells in "piecemeal" necrosis, the lesion characteristic for the progression of liver disease. Serum of patients with active liver disease were found to bind on immunocytochemical analysis, a carbohydrate containing material in proliferated bile ductules and in abnormal bile. A pathogenetic effect of antigen-antibody complexes distributed through the bile duct has been demonstrated and postulated to be a main factor in self-perpetuation of liver disease.

Electron microscopic studies of renal glomeruli focused on alterations of diabetic nephropathy, toxemia of pregnancy, and lupus nephritis. In diabetes there was marked thickening of the glomerular capillary basement membrane, often long before the onset of clinical symptoms. In later stages, there was extensive deposition of basement-membrane-like material in the intercapillary spaces, giving the appearance of diffuse intercapillary glomerulosclerosis in the light microscope. Kimmelstiel-Wilson nodules represented an extreme progression of this change.

In preeclampsia, marked endothelial and intercapillary cellular swelling were found, often accompanied by subendothelial deposits of proteinaceous material. These changes obliterate the lumen and account for the glomerular ischemia. They do not resolve completely following delivery; residual glomerular

alterations have been found up to two years later. In a number of cases with inadequate history, electron microscopy has been utilized to make a very early diagnosis of toxemia. In systemic lupus erythematosus, marked increase in basement membrane branching and intercapillary cellularity were found, accompanied by basement membrane thickening and numerous small intramembraneous deposits. These changes were not affected by steroid therapy.

Observed intrapulmonary occlusive vascular anomalies in newborns with multiple congenital defects were related to the development of pulmonary hypertension. Glomoid intrapulmonary vascular obstructions in pulmonary hypertension were described as congenital lesions.

Using immunocytochemical methods, gamma globulin bound antibody was found in acute hyperergic vascular lesions (human and experimental), while inhibition of serum proteins was shown in necrotizing vasculitis of hypertension (experimental).

In idiopathic thrombocytopenic purpura phospholipid was found in splenic histiocytes.

Analysis of many cases of pulmonary interstitial emphysema in the newborn revealed that respiratory obstruction or pneumonia, and developmental defects play a prominent etiologic role.

Placentas from over 200 cases of hypertensive disease of pregnancy, essential hypertension, and placental dysfunction syndrome without hypertension, showed increased incidence of ischemic infarcts and exaggeration of aging changes in the syncytial trophoblast in placentas of toxemia, while ischemic involution of chorionic villi with excessive deposition of placental fibrinoid was a frequent finding in the placental dysfunction syndrome irrespective of accompanying hypertensive disease.

In intrauterine salivary gland virus infection, demonstration of characteristic inclusions in the placenta was not possible in the material. Lesions appeared non-specific. Infiltration of the fetal placenta with plasma cells warrant a high index of suspicion.

Systematic analysis of placentas from multiple gestation is part of a longitudinal study of twins.

Acknowledgment

The work in this department has received generous support from Health Research Council of the City of New York, The United States Public Health Service, United Cerebral Palsy Association, The American Cancer Society, Association for the Aid of Crippled Children, Higgins Fund, Smith, Kline and French Laboratories, Parkinson's Disease Foundation, and National Mental Health Association.



Pediatrics

EDWARD C. CURNEN, JR.
*Carpentier Professor and
Chairman of the Department
Director of Service*

During 1961 the staff in pediatrics was strengthened by a number of changes and additions and by improvements in provision for support. The teaching program was subjected to careful scrutiny and some revision. Research activities increased and continued to be productive in cramped quarters.

Changes in Staff

Several new members were appointed to the staff. Dr. Robert W. Winters, Associate Professor and Associate Attending Pediatrician, has a distinguished record of research accomplishments with notable contributions to the study of vitamin D resistant rickets, salicylate intoxication and renal function. Dr. Chris P. Katsampes has joined the staff on a part-time basis as Assistant Clinical Professor and Assistant Attending Pediatrician in Vanderbilt Clinic. Dr. Nicholas T. Jaco will serve as Assistant Clinical Professor assigned to St. Luke's Hospital. Dr. Jaco will devote himself to a study of the respiratory distress syndrome in newborn and premature infants. Dr. Ida I. Nakashima was appointed Instructor and Assistant Pediatrician and will be associated on a

part-time basis with the Child Development Program. Dr. Thomas J. Moore was appointed Chief Resident and Assistant in Pediatrics. Dr. Vivien S. Lee Loh was appointed Assistant in Pediatrics to work with Professor Ruth C. Harris. The following members of the faculty were given new appointments in the Hospital: Professor Horace L. Hodes as Associate Attending Pediatrician, Professor J. Frederick Eagle, Jr. and Professor Leonard S. James as Assistant Attending Pediatricians.

New fellowship appointments were given to the following former Assistant Residents in the Hospital: Dr. Jean A. Cortner (Biochemistry and Genetics), Dr. Nicholas Cunningham and Dr. Gillian M. Gandy (with Professor James), Dr. John Nicholson (Biochemistry), and Dr. Joseph A. Silverman (Allergy). In addition Dr. Grace Shook Yue Cheng was appointed a Fellow in Cardiology and Dr. Faith H. Kung in Hematology and Oncology.

New appointments in Vanderbilt Clinic were given to Dr. Marilyn Schotland (Fellow in Biochemistry) also to Dr. Katina A. Rachiti and Dr. Sheldon G. Leibow as Assistant Pediatricians.

It is a pleasure to announce the following promotions: Dr. Thomas C. Goodwin to Clinical Professor (Mary Imogene Bassett Hospital), Dr. Melvin M. Grumbach to Associate Professor and Associate Attending Pediatrician; Dr. William A. Silverman to Associate Professor; Dr. Douglas S. Damrosch, Dr. Sylvia P. Griffiths, and Dr. Katherine Sprunt to Assistant Professors; Dr. Peter R. Scaglione, Dr. Rhoda Mickey and Dr. Carolyn R. Denning to Associates and Assistant Attending Pediatricians; Dr. Selma R. Kaplan to Instructor and Assistant Pediatrician; Dr. Akira Morishima, Dr. Herman Grossman, Dr. Shirley Mayer, Dr. Jack Shiller and Dr. Elizabeth Ufford to Instructors.

Professor Damrosch, Dr. Scaglione and Professor Silverman individually decided to give up private practice for full-time academic work. Professors Grumbach, Silverman and Jacob were awarded investigatorships by the New York City Health Research Council. Professor Damrosch was awarded a Senior Research Fellowship by the United States Public Health Service to obtain additional training and to conduct research in microbiology and immunology.

Grateful acknowledgment for long and faithful service is extended to Dr. Kenneth Metcalf who retired this year.

Professors Hattie E. Alexander and Katherine Sprunt are continuing to pursue their major investigation on the control of heritable traits of enteroviruses with emphasis at present on the facts which influence the function of the viral genes or ribonucleic acid. The control of inheritance of bacteria by deoxyribonucleic acid is under study by Professor Alexander and Miss Grace Leidy in an attempt to perfect it as a tool or model for a number of purposes. The principles found to govern the process in bacteria are being examined for their application to mammalian cells in tissue culture.

Professor Sprunt is the major investigator of two other projects. They concern the role of viruses on response of patients to bacterial infections and the nature of the staphylococcus problem. The normal newborn infants in the Sloane Nurseries are being studied in an attempt to answer certain questions: Is there a correlation between phage type of staphylococcus and the prevalence of staphylococcal disease after colonization? Are strains of staphylococci of phage type 80/81 characteristically "epidemic" in nature? If we could eliminate coagulase positive staphylococci from normal newborn infants, will this prove to be of benefit to the baby?

Professors Alexander and Damrosch and Dr. Herman Grossman are studying the factors deter-

mining host reaction to tubercle bacilli. One of the most important problems recognized in this laboratory, and in others during the past two years, is the significance to patients of infections in childhood caused by acid-fast bacilli which because of inadequate knowledge are classified as atypical mycobacteria. The major interest is the relationship of these organisms to tubercle bacilli and the criteria which will provide a valid basis for separation from mycobacteria tuberculosis.

Professor Edward C. Curnen with the assistance of Miss Eru Tanabe is conducting investigations on the association of viruses with certain diseases particularly those affecting the central nervous system. A report of studies on cerebellar ataxia associated with poliovirus infection was prepared in collaboration with Dr. Harrie Chamberlin of Chapel Hill, N. C. A study on the use of attenuated measles vaccine in children with cardiac disease was conducted in collaboration with Dr. Joseph Silverman, Professor Sidney Blumenthal and Dr. Harry Meyer of the National Institutes of Health.

The research activities of Professor Dorothy H. Andersen continue to relate to cystic fibrosis. Two full-time research fellows, Dr. Carolyn R. Denning and Dr. Herbert I. Cohen, carry on the cystic fibrosis clinics for children and for adults and are responsible for management of patients on the wards. The total clinic census is about 150 active cases. This year has seen progress on studies of pulmonary function and treatment of the respiratory infections in both early stages by antibiotics and physiotherapy and later stages by positive pressure breathing and several forms of assisted respiration. Other studies included a comparison of methods for the sweat test, continuation of studies on eye changes, and of teeth pigmentation.

The study of congenital heart disease has continued to concern Professor Andersen as part of the congenital heart program.

Professor William A. Blanc has continued his work on gonads in anomalies of sex differentiation. He has instituted a new screening method for detecting inclusion cells in urine by the Millipore filter. Work on the "amniotic infection syndrome" has continued, and other problems of perinatal pathology are in progress. Professor Blanc in collaboration with Dr. Thomas V. Santulli, Associate Professor of Clinical Surgery and Attending Surgeon, has produced intrauterine atresia of the intestine in dogs and rabbits fetuses by surgical means.

Renal function after intracardiac operations involving total body perfusion has been under intensive study by Dr. Jose Strauss in collaboration

with Professor James R. Malm, Assistant Professor of Surgery and Assistant Attending Surgeon, and Professor Sidney Blumenthal.

A pilot project of a cooperative study of the natural history of congenital cardiac defects has been inaugurated. This is sponsored by the American Heart Association with participation by four medical schools in addition to the Department of Pediatrics at Columbia University. Professor Blumenthal has served as a member of the planning committee for this project. Professor Sylvia P. Griffiths has continued her studies of the natural history of ventricular septal defects with particular emphasis upon the clinical course in adult life.

The study of the changing pattern of the electrocardiogram in normal full term and premature infants has been conducted by Dr. Katherine Halloran and Dr. O. Robert Levine. The incidence, manifestations and management of congenital cardiac defects resulting in severe symptomatology has been under intensive study in collaboration with the cardiovascular surgical service.

The cooperative study of the treatment of patients with acute rheumatic fever continues.

The number of patients with heart disease cared for in the clinics and wards continues to increase. The Children's Cardiac Clinic examined 240 new patients during the past year and now has an active case load of 927 patients.

The Cardiac Group continues to participate in pre and post operative management and to monitor physiologic parameters in the operating room during all "open heart" procedures. These now average 2-3 cases per week.

In the year past, the Cardiovascular Laboratory studied a total of 333 patients, 172 (52%) of whom were twelve years of age and over, 103 (31%) of whom were one to twelve years of age, 25 (7%) of whom were three months to one year of age and 33 (10%) of whom were three months of age and under. A total of 170 right heart catheterizations, 38 left heart catheterizations, 197 right-sided selective angiocardiograms and 33 left-sided angiocardiograms were performed.

The use of the platinum/hydrogen electrode catheter for intracardiac shunt detection has been continued and extended, as has the statistical approach to the evaluation of the usual oxygen sampling technique.

The main foci of interest of the laboratory have been two. The early study of infants under one year of age with congenital heart disease is of paramount concern if the heavy mortality in the first year of life is to be reduced. An increasing number of infants is

studied in the laboratory each year. The study of the beat by beat stroke outputs of the heart has been continued. The following have participated in the laboratory's activities: Dr. Joseph Grayzel, Dr. Andrew P. Somlyo and Dr. Levine.

Professor Grumbach's work has continued on various aspects of pediatric endocrinology and metabolism. Professor Grumbach in conjunction with Dr. Selma L. Kaplan is studying the specificity of rabbit antiserum to human growth hormone and the antigenic homogeneity of human growth hormone have progressed. By immunoelectrophoresis the reaction of human growth hormone suggested heterogeneity in the electrophoretic behavior of the purified hormone. When growth hormone was subjected to starch gel electrophoresis three distinct major components were identified, exhibiting growth hormone activity and which reacted with the anti-human growth hormone serum in a jellified medium. These observations indicate the presence of identical or closely related antigenic determinants in each of the components. These findings may be a consequence of denaturation of the hormone during purification or possibly polymorphism. The Read method for determining growth hormone in human serum by means of the hemagglutination-inhibition reaction was shown to be unreliable because of the presence in sera of non-specific inhibitors. This observation is disappointing; a reliable method for measuring the growth hormone level in serum would be of considerable value in the study of growth disorders in children. Attempts are being made to inactivate or remove the inhibitors by various techniques. Studies are in progress to determine the time of appearance of growth hormone in the fetal pituitary gland.

With Dr. Morishima, Professor Grumbach is studying human chromosomes in cells cultured in vitro on patients with sexual anomalies and other congenital malformations. The method of preparing cultured cells for chromosome analysis from tissue was modified to permit observations on the nuclear sex chromatin in the same cell population used for determining chromosome constitution. This procedure, when utilized in conjunction with analysis of leucocytes established in culture from peripheral blood, has been of considerable value in the detection of sex chromosome mosaicism. The prevalence of sex chromosome mosaicism in sex chromatin-positive patients with gonadal dysgenesis (Turner's syndrome) suggests that individuals with this disorder who have an XO sex chromosome constitution may arise more frequently than previously appreciated from a mitotic error occurring soon after fertili-

zation of the zygote. Of interest are the results of studies of the time in interphase when synthesis and replication of DNA take place in human chromosomes. Human cells cultured *in vitro* were exposed briefly to tritium-labeled thymidine and incorporated into DNA; this was determined by study of autoradiographs of chromosome preparations. These investigations were carried out in collaboration with Dr. J. Herbert Taylor, Professor of Cell Biology of Columbia University. By this technique, one of the two homologous X-chromosomes in the cells of normal females was found to replicate later in the intermitotic stage than the other X-chromosome and the rest of the chromosome complement. The presence of two such late replicating X-chromosomes in cells with an XXX sex chromosome constitution and two sex chromatin bodies and the absence of an asynchromous X-chromosome among normal males and individuals with an XO constitution and sex chromatin-negative nuclei seems to indicate that sex chromatin may be expressed by condensation of only the late replicating X-chromosome in interphase nuclei. These new findings strongly support the previous contention of morphological and functional differences in the two homologous X-chromosome in the somatic nuclei of human females and the origin of sex chromatin from a single X-chromosome.

Dr. T. Donald Eisenstein is carrying forward investigations of corticosteroid metabolism in premature infants. He has found that the premature infant metabolizes a major portion of administered cortisol to 6- β -hydroxy-cortisol.

Dr. Schotland has completed observations on the anti-diuretic effect of chlorothiazide and its analogues in infants and children with nephrogenic diabetes insipidus. In most instances a 30 per cent reduction in urinary output was observed. The results suggest that the drug may be of considerable value in the young infant with this disorder by decreasing the very large requirement for water, facilitating maintenance of a satisfactory state of hydration. The administration of hydro-cortisone or its analogues inhibited or abolished the anti-diuretic effect of chlorothiazide. Granulocytopenia was observed in one infant indicating that careful observation for toxic effects is necessary.

Professor Grumbach, Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology), and Dr. Raymond L. Vande Wiele, Assistant Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, are continuing their studies on the secretion rate of a variety of C_{19} and C_{21} steroids in patients with congenital adrenal hyperplasia.

Professor Winters assisted by Dr. Scaglione and in collaboration with Dr. Gabriel G. Nahas, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist, has initiated a series of experiments concerned with the characterization of dilutional acidosis. It has been found that infusion of hypertonic saline into dogs is accompanied by a fall in total CO_2 content of plasma, a fall in blood pH but no consistent change in calculated pCO_2 . The mechanism of the acidosis appears to be one of dilution of the extracellular fluid by an osmotically induced shift of water from the intracellular fluid accompanied by an equalization of pCO_2 in both compartments.

Dr. Scaglione has continued his long term studies of the course of childhood nephrosis and the results of various forms of treatment of this disorder. This study now encompasses approximately 100 patients with various forms of this disease.

Professor Harris has continued studies of bilirubinemia and associated blood values in premature infants. This work is being conducted in collaboration with Professor Gilbert W. Mellin, Dr. Michael Katzenstein, Professor James A. Wolff and Dr. Paul A. Marks, Associate Professor of Medicine and Assistant Attending Physician. Approximately 300 patients have been admitted to the premature nursery during the period of this investigation and it is hoped that at least two-thirds of these patients will be included. Analysis of the data is in progress. Professor Harris has studied electrolyte abnormalities in patients with glycogen storage disease and has found elevations in sodium and chloride content of sweat in some of these patients. Currently studies of enzyme deficiencies of patients with galactosemia are in progress with the plan to extend these studies to individuals with congenital cataracts. Continued use of the Menghini needle for liver biopsy has proven of great value in the evaluation of a variety of problems. Besides aiding in diagnosis of obstructive jaundice, this biopsy technique has made possible studies of enzyme activity, culture for presence of viruses and observations by electron microscopy. Amino acid paper chromatography continues to be used as a screening tool for evaluation of hepatic, renal and neurologic disorders.

Since January 1959 the Child Development Program has been evolving as a study of test gravidae and their off-spring from the time of registration of each gravida in the Obstetrical Antepartum Clinic through the child's early years. This program, sponsored by the National Institute of Neurological Diseases and Blindness, is a long-term prospective study seeking the etiology of cerebral palsy and related

mental and neurological diseases in children. In cooperation with fourteen other teaching institutions throughout the country, the College of Physicians and Surgeons has the local participation of the Departments of Obstetrics and Gynecology, Anesthesiology, Psychiatry, Neurology, Otolaryngology, Pathology, and Pediatrics. Dr. Marguerite J. Gates, Instructor in the Department of Pediatrics, serves as Project Director for the local effort, coordinating the activities of the several departments.

In 1961 a total of 486 gravidæ were enrolled. Their antepartum course was carefully documented by the obstetrical team working under the direction of Dr. Emanuel A. Friedman, Assistant Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist. Dr. Vincent Freda assisted him. In October 1961 Dr. Nuran Turksoy, Visiting Fellow, joined the obstetrical staff of the program.

482 infants, born in 1961, had daily neonatal examinations under the direction of Dr. Elizabeth Ufford. These newborns also had special examinations oriented toward neurological findings under the direction of Dr. Niels Low, Assistant Professor of Neurology (Pediatrics). In July 1961 Dr. Donald Schotland, Dr. Lucien Cote, and Dr. Elizabeth Decker left the staff of the Child Development Program, and were replaced by Dr. Arnold P. Gold, Assistant Professor of Clinical Neurology and Assistant Attending Neurologist, and Drs. Williams Clark and Maurice Charlton, Assistants in Neurology. Special laboratory tests including bilirubin, hematocrit, blood type and Coombs were performed on all study babies.

431 infants were studied in the Vanderbilt Clinic at four months of age. In addition to Dr. Ufford, Dr. Rhoda Mickey, Dr. Mary Samuels, Dr. Margaret Rice and Dr. Thomas Patrick performed these examinations. In October 1961 Dr. Ida Nakashima joined the regular study staff as Instructor in Pediatrics.

At eight months of age 400 infants had psychological testing under the supervision of Dr. William N. Thetford, Associate Professor of Medical Psychology. These children were examined in special offices at 238 Fort Washington Avenue. Study psychologists began in the fall of 1961 participating in a nationwide pretest of a proposed psychological evaluation for four-year-old children.

Professor Low's group saw 423 one-year-old children for a combined neuro-pediatric examination, most of these children being seen at offices located at 617 West 168th Street.

As some of our children reached two years the

pediatric staff began regular examinations for this age group, 250 exams also being performed at 617 West 168th Street.

In the fall of 1961 the Department of Otolaryngology became active with the beginning of a pretest of proposed speech and hearing examinations for all study children. Under the direction of Mrs. Shulamith Kastein these preliminary examinations have been conducted in the Vanderbilt Clinic where the hospital has made available some clinic space for the special purposes of the pretest.

Professor Blanc has done gross and microscopic examinations of the placenta on every study birth. In addition, he has had a major responsibility for formulation of the autopsy protocol being developed for the nationwide project. Locally he has supervised all pathologic studies on Child Development Program infants.

Maintenance of the sample, approximately one of every six Sloane Hospital ward deliveries, presents a major problem for both the present and the future since it is contemplated that periodic examinations will continue at regular intervals until each child reaches school age. Increasing effort in this direction has achieved very satisfactory returns through the continued cooperation of house staff and related services.

On January 1, 1961 the Fetal Life Study under the direction of Professor Mellin began a complete tabulation of all pregnant women who attended the Sloane Clinic of the Columbia-Presbyterian Medical Center. Such a tabulation will provide a detailed account of pregnancy outcome, birth injuries, congenital malformations, Rh negative mothers, pertinent autopsy findings, and numerous deviations, as well as survival and management in the early neonatal period. This serves as a comprehensive coverage of newborns (not only those residing in the Sloane nurseries, but also those in Babies Hospital), as a clinical epidemiological unit as well as a statistical unit. It is anticipated that one year mortality may be followed by matching birth certificates and death certificates on file in the Health Department.

Comprehensive tabulation of the Fetal Life Study Part I (5,964 cases) is progressing. The definitive tabulation and coding of Fetal Life Study Part II (4,300 cases) has continued at the rate of approximately 1,000 cases in the past year, giving us a total of over 1,600 completed cases.

Mrs. Ruth Brooks and Mrs. Phyllis Michelsen hold weekly seminar sessions with Professor Mellin concerning the planning of processing and analysis of data.

Mrs. Tatiana Lermontoff has collected data on

capillary sedimentation rates along with her microhematocrits on the premature infants.

In cooperation with Professor Blanc the tabulation and analysis of data concerning hematocrit values in premature infants in relation to intraventricular hemorrhage and autopsy findings have been completed. Normal range of variation has been established. However, no prognostic value seemed evident in the data for the use of the microhematocrit to predict intraventricular hemorrhage.

Dr. Michael Katzenstein has standardized a capillary prothrombin method which now will be employed to determine the effectiveness of oral Vitamin K. In cooperation with Professors Harris, Wolff and Mellin, he has conducted a survey of premature infants to determine the relationship of bilirubin level to various other factors, plus collecting samples for Glucose-6-Phosphate determinations. Dr. Katzenstein and Professor Mellin have been making daily rounds on all newborn infants who present any deviation from normal and are now in the process of establishing a photographic file of neonatal malformations and deviations.

In cooperation with Professor Silverman and Dr. Jack Shiller a code has been developed for tabulation of experience in the Premature Nursery. Mrs. Thelma Phelan is now coding this data.

Professor William A. Silverman completed the third edition of the textbook Dunham's *Premature Infants*, and the volume was published in April, 1961.

In collaboration with Professor Frederick J. Agate, Associate Professor of Anatomy, Professor Silverman has continued studies of physical environmental influences on premature infants. Investigation of the acute effects of warming premature infants with very low body temperatures by means of continuous recordings of cardio-respiratory and peripheral muscular activity have been made possible by a grant from the United States Public Health Service. These studies are designed to throw some light on the relative contributions of muscular and extramuscular thermogenesis to the regulation of body temperature of premature infants since it has been demonstrated that they are capable of considerable increases in heat production without visible shivering when in environments that are below the neutral temperature. Based on the results of completed studies indicating improved survival of premature infants in warm environments, Professors Agate and Silverman have designed an idealized incubator which is being constructed with the cooperation and support of Air Shields Inc. of Hatboro, Pennsylvania.

Professors Agate and Silverman are also investigating the postnatal development of cardio-respira-

tory autonomic reflexes by means of serial recordings in premature infants born at various gestational ages. Generous support of the Dunlevy Milbank Foundation has made it possible to obtain equipment for these studies and also to secure the valuable services of an electronics technician, Mr. Harvey Cohen.

Dr. Elizabeth Decker has continued her longitudinal study of the neurologic development of premature infants. By means of serial neurologic examinations and electroencephalograms performed by Mrs. Lermontoff, Dr. Decker has attempted early diagnosis of damage to the central nervous system in these subjects. Professor Silverman and Mrs. Minna M. Genn completed the first phase of a study which indicated that as compared with matched controls there was an increased incidence of mental retardation among premature infants with retrolental fibroplasia. Since the incidence of retrolental fibroplasia has been reduced sharply in the past seven years, a series of recent survivors of premature birth will now be examined in the hope that further clues will be uncovered to elucidate the nature of the observed association.

Professor Harris, Professor Wolff, Professor Mellin and Dr. Katzenstein concluded an investigation of the many factors which influence the distribution of unconjugated bilirubin in the tissues and vascular space of prematurely born infants. It is hoped that these observations will provide information which will be useful in improving present methods of evaluating premature infants with non-hemolytic jaundice, because Dr. Jack Shiller and Professor Silverman presented evidence which suggested that bilirubine-mia alone was not a completely satisfactory criterion on which to base an estimate of the risk of brain damage in these patients. Dr. Katzenstein is studying the possibility of changing the protein composition of the blood of premature infants in order to effect favorably the distribution of bilirubin in jaundiced babies.

Dr. Shiller and Mrs. Phelan are compiling a coded summary of the hospital course and outcome of more than 2500 infants who were admitted to the premature nursery since 1949.

Drs. Mieczyslaw Finster and Stuart J. Leavitt, both Instructors in Anesthesiology and Assistant Anesthesiologists, are investigating respiratory performance of premature infants. They have constructed a device to increase the functional residual capacity of the lung in these infants, and are studying the influence of this measure in small newborn subjects with respiratory distress.

Professor Silverman, Dr. Edward V. Zegarelli, Robinson Professor of Dentistry and Attending

Dental Surgeon, and Dr. Edmund Applebaum, Associate Professor Dental Anatomy, have collected and are examining the exfoliated deciduous teeth of a group of expremature children for the purpose of studying the association between brain damage and hypoplasia of the dental enamel. They have also observed deposits of a fluorescent substance which is suggestive of tetracycline in the teeth of some of these children who received brief courses of this drug in the first days of life.

During the last year, studies of renal function in the immediate neonatal period have been made by Professor L. Stanley James in collaboration with Dr. Jose Strauss.

These studies were undertaken to ascertain whether renal function could be correlated with the varying degrees of acidosis present at birth and in the immediate neonatal period. The initial part of this study involved healthy newborn babies all of whom achieved a relatively normal acid-base balance in the first few hours of life. Although no obvious correlation with pH was apparent in this healthy group, several interesting findings were observed.

These include considerable variability from baby to baby in regard to urine flow, concentrating ability, renal plasma flow and glomerular filtration rate. Higher flows and greater powers of concentration and dilution of the urine appear to be present than have been believed in the past. Over a more extended study period the various renal functions appear to adopt a certain pattern. The explanation is not likely to be simple, not only because of the acute stress of labor and delivery, but also because of readjustments involving the intracellular fluid compartments, and indeed every system in the body.

Hematologic research, under the direction of Professor Wolff, has been directed toward investigation of hemaglobinopathies, study of hyperbilirubinemia, and the chemotherapy of acute leukemia and of solid tumors. Dr. Anneliese L. Sitarz has continued her participation in these activities. Also contributing to this program was Dr. Charles B. Pratt, until his departure in July 1961, a recipient of a fellowship from the National Institutes of Health, and Dr. Faith H. Kung, who succeeded Dr. Pratt.

Laboratory and genetic investigation of children with Thalassemia Major has resulted in the recognition of various types of Thalassemia. A preliminary report by Professor Wolff concerning the heterogeneity of this disease was presented to the New York Society for the Study of Blood in March 1961 and a more detailed analysis at the meeting of The American Hematology Society at Los Angeles in November 1961. In collaboration with Professor

Harris, Professor Mellin, Professor Silverman and Dr. Katzenstein, the hematology research laboratory has continued its investigation of hyperbilirubinemia in premature infants.

Studies begun last year by Dr. Sitarz and Professor Wolff in collaboration with Dr. John E. Ultmann, Associate in Medicine and Assistant Physician, concerning blood destruction in patients with Thalassemia have been extended to correlate these findings with the clinical course of the disease. Studies in a 4 year old boy concerning acanthocytosis, a new genetic syndrome with absent beta lipoprotein and an erythrocyte anomaly, were reported by Professor Wolff at the annual meeting of The Society for Pediatric Research in Atlantic City in May 1961. Dr. Kung has begun an investigation of the distribution of fetal hemoglobin in erythrocytes in various congenital and acquired hematologic disorders.

Professor Wolff, Dr. Sitarz, Dr. Pratt and Dr. Kung have represented the Department of Pediatrics in its continued participation in the work of the Combined Pediatric Tumor Clinic, under the direction of Professor Thomas V. Santulli, Associate Professor of Clinical Surgery and Attending Surgeon. An exhaustive review of experience at the Babies Hospital with childhood neuroblastoma, begun last year by Dr. Memee H. King, has been augmented and completed by Dr. Pratt and is to be published soon.

An active program of study and chemotherapy of metastatic retinoblastoma in collaboration with Dr. Algernon B. Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist, Dr. Robert Ellsworth, Instructor in Ophthalmology and Assistant Ophthalmologist, and their associates, has been initiated during the past year. Dr. Pratt demonstrated the usefulness of combined systemic chemotherapy with cytoxan, actinomycin D and methotrexate in the palliation of widespread metastatic retinoblastoma. A report of these observations was made in November 1961 by Professor Wolff at the Second Conference on Experimental Clinical Cancer Chemotherapy in Washington, D. C.

Professor Wolff, the principal investigator, and Dr. Sitarz have continued as a member of Leukemia Chemotherapy Cooperative Group A. A study of the comparative effect of 6-mercaptopurine, thioguanine (6-mercapto-2-aminopurine) and thioguanosine (2-amino-6-mercapto-9 B-ribofuranosylpurine) in childhood leukemia has just been completed. A new study utilizing steroid pretreatment followed by antimetabolite therapy was begun in July 1961.

Professor Damrosch is embarking on studies of possible autoimmune mechanisms in the so-called

post-cardiotomy syndrome and is also studying some factors effecting the non-specific defense mechanisms.

Patient Care

The total number of patients admitted to the Babies Hospital was 5,019, which represents 58,219 patient days care. In the private offices of the Babies Hospital there were 15,453 patient visits.

In the out-patient department, during the year 1961, structural changes were made which have improved the character of the clinic. These changes included redecoration, installation of new benches, and improved equipment. Patient visits in the clinic totaled 42,094. Of these 6,364 were new patients, 17,675 specialty clinic visits, 2,494 new patients in specialty clinics. These figures represent a 7% decrease for the total out-patient load.

Awards

Professor Alexander was the recipient of The Oscar B. Hunter Award in Therapeutics presented by the American Therapeutic Society of New York. Professor Andersen received an award from the Young Men's Philanthropic League, for her "dedicated service and outstanding achievement in the field of cystic fibrosis."

Donors

The Department of Pediatrics wishes to express sincere gratitude to the loyal individuals and organizations who have contributed to the operational and research activities of the department: Aaron E. Norman Fund, Inc., American Heart Association Inc., Air Shield, Inc., Association for the Aid of Crippled Children, Board of Women Managers of the Babies Hospital, Mr. and Mrs. Arthur W. Haydon, The John A. Hartford Foundation, Inc., Health Research Council of New York City, Kidney Disease Foundation, Lillia Babbitt Hyde Foundation, Mary Louise Johnson Foundation, Louis Marx Foundation, the William J. Matheson Foundation, Rustin McIntosh Fund, Mead Johnson & Company, National Cystic Fibrosis Research Foundation, National Foundation, National Institutes of Health, New York Heart Association, Nutrition Foundation, William E. S. Strong Memorial Fund, United Fruit Company, Sidney J. Weinberg Foundation, Leukemia Research Fund in memory of Foxhall Parker Jones, III, Pediatric Tumor Fund contributions by friends of Carol Nelson, the Alumni Association of the Babies Hospital, and many individual benefactors including grateful parents and friends.



Pharmacology

HARRY B. VAN DYKE

*Hosack Professor and
Chairman of the Department*

The program of instruction of undergraduate medical students in pharmacology was not radically altered in 1961. As in former years, the invaluable contributions of members of other departments to instruction both by lectures and by demonstration experiments increased the range and depth in which the subject could be presented. The topics and the principal cooperating instructors were: anticonvulsive drugs, Dr. Sidney Carter, Professor of Clinical Neurology and Attending Neurologist; statistics of biological assay, Dr. John W. Fertig, Professor of Biostatistics; special aspects of anesthesia, Dr. Emanuel M. Papper, Professor of Anesthesiology and Director of the Anesthesiology Service; metals in chemotherapy and toxicology, Dr. John V. Taggart, Professor of Medicine and Attending Physician; respiratory pharmacology, Dr. Gabriel G. Nahas, Associate Professor of Anesthesiology and Associate Attending Anesthesiologist; and chemotherapy of neoplasms, Dr. John E. Ultmann, Associate in Medicine and Assistant Physician. Professor Frederick G. Hofmann continued to represent the department in the course, Medical Therapeutics and Applied

Pharmacology, offered in collaboration with the Department of Medicine in the third and fourth years of the undergraduate curriculum. Dr. Anthony M. Perks was appointed Instructor in the department. During the first half of 1961, Dr. Michael Ginsburg of the University of Bristol served as a Visiting Associate Professor. In addition to instruction of medical students in the required course in pharmacology, the department offers third and fourth year medical students an opportunity to undertake research under the supervision of a member of the staff. In 1961, Mr. Richard I. Ulin, a fourth year medical student working under the supervision of Professor Shih-Chun Wang, investigated the mechanism of morphine-induced mydriasis in the cat.

The demand for well-trained pharmacologists as future teachers and investigators in our medical schools and as research workers in government and industrial laboratories far exceeds the supply. The department, as part of the Faculty of Pure Science in the University, has a continuing obligation to train graduate and postgraduate students for a career in

pharmacology. The National Institutes of Health have given the department a generous grant to support graduate training. The problem of recruitment of qualified graduate students thus has been greatly eased because adequate financial support can now be offered. In 1961 there were eight predoctoral students in various phases of training in the department. In addition a postdoctoral training program in neuropharmacology is sponsored by the National Institute for Neurological Diseases and Blindness. It is administered by Professor Wang. Postdoctoral trainees in anesthesiology may also work for a period in the department. The total number of postdoctoral trainees working under these programs was four. Exceptional undergraduate students occasionally are accepted for an apprenticeship in research before their senior year. One student worked according to this plan in 1961.

Seminars in which the results of research are evaluated by experts are important in any department in which investigative work is fostered. A more elaborate program of seminars was established in collaboration with the Department of Physiology. Each department sponsors seminars on alternate weeks.

The principal research interests of the department are in the following fields: the pharmacology of the cardiovascular system, biochemical and comparative aspects of endocrinology, and neuropharmacology, including the control of respiration. Professor Herbert J. Bartelstone continued his investigation of the physiology and pharmacology of the mammalian venous system. A large group of drugs was investigated by a method which distinguished their action on the veins from that on other parts of the vascular system. Work was focused on acetylcholine after it was found that it seemed to constrict the venous bed with concurrent arterial dilatation. Cardiac, arterial, ganglionic, adrenergic, and reflex factors in general were systematically ruled out as affecting the venous response to acetylcholine. Acetylcholine appears to cause venous constriction by reacting with receptors that are specifically blocked by "parasympatholytic" agents. This work will be extended during the coming year by studying the actions of other vasoactive drugs on the venous system of anesthetized animals.

Professor Hofmann further extended his studies of the biogenesis of steroids by the adrenal cortex and testis. Although these two tissues possess in common a number of steroidogenic processes, their secretions are undeniably different. He attempted to ascertain whether these differences were determined by any one component within these two tissues. The

results indicated that the composition of adrenocortical secretions is ultimately controlled by enzymic systems resident only in mitochondria; adrenal microsomes do not possess the enzymic systems requisite for the formation of the characteristic secretory products of this gland. The mitochondria of the testis possess only those enzymes needed for the elaboration of androgens; the microsomes of the testis also possess these enzymic systems and, in addition, two enzymic systems characteristic of adrenocortical cells. One cannot, therefore, ascribe the ultimate regulation of testicular secretions to either intracellular component of the cells of Leydig. Mr. L. Spatz, a third year graduate student, is associated with Professor Hofmann in this research.

Professor Hofmann has also continued studies of neoplastic adrenal glands in mice that, by morphologic criteria, appear to secrete androgenic hormones. In collaboration with Dr. Nicholas P. Christy, Assistant Professor of Medicine and Assistant Attending Physician, studies of the very large tumors induced by gonadectomy in one strain of mice have been extended. These tumors possess the enzymes that participate in the conventional pathway for the biosynthesis of androgens. However, the substrate required for these enzymic systems is not produced by these tumors. This suggests that these tumors employ some novel pathway for the production of androgens. Professor Hofmann, Professor Christy and Dr. Robert Huseby of the American Medical Center at Denver, are investigating another strain of mice in which ovariectomy is followed by adrenocortical hyperplasia and morphologic evidence of androgenic secretions. They have shown that these abnormal adrenal glands can convert progesterone to testosterone and androstenedione, a finding that has not been made previously with any mouse adrenal glands, normal or neoplastic. The biosynthetic pathways involved in this conversion are now being investigated.

During 1961 Professor Wilbur H. Sawyer has continued the investigation of the relation of the molecular structure of neurohypophyseal hormones and their analogues to their biological activities. Particular attention has been devoted to the influence of arginine in the side chain of these peptides on the antidiuretic response in rats. The 8-arginine moiety also appears to influence the renal metabolism of these peptides. Arginine vasopressin is removed from the circulation by the kidneys at a considerably faster rate than is lysine vasopressin, although both peptides are excreted at about the same rate.

Professor Sawyer has also further studied the

native neurohypophysial peptides of fishes. It was believed earlier that arginine vasotocin and oxytocin are the natural neurohypophysial peptides of teleost fishes. Arginine vasotocin has since been chemically identified by three different groups of workers in three species of teleost fishes. The identity of the oxytocin-like principle, however, remains unknown. British investigators have demonstrated that it is not oxytocin, at least in the pollack, although it resembles it closely. Professor Sawyer has confirmed this observation, and has demonstrated a similar principle in pituitaries from two other teleosts, the carp and the hake. From these continuing studies on the pharmacological properties of oxytocin analogues it can be said, with some assurance, that the unknown teleost oxytocin-like peptide cannot be identical with most of the active-oxytocin analogues that have been examined. Two of the known analogues cannot be ruled out. Positive identification will require isolation of the principle and amino acid analysis.

Dr. Anthony M. Perks has recently joined the department as an Instructor. He has spent the past few years studying the chromatographic and pharmacological behavior of the oxytocic principle in elasmobranch neurointermediate lobes. This principle occurs in all the species of sharks, skates and rays that he has collected. It differs pharmacologically from the teleost oxytocin-like principle and from any oxytocin analogue that has been studied here. Dr. Perks is continuing this work.

Professor Harry B. van Dyke, in collaboration with Dr. Heinz O. H. Zunker, studied the role of fibroinlysin in the degradation of neurohypophysial hormones. Oxytocin was not inactivated; partial destruction of arginine vasopressin occurred only with highly active preparations. The effect of drugs and of highly active peptides on the milk-ejection response was also studied.

Dr. Hsueh-Hwa Wang has completed a study on the cardiovascular action of trimethobenzamide (Tigan). It was found that trimethobenzamide gives a transient vasodepressor response due in part to a mild adrenergic blocking action and in part to a direct smooth-muscle relaxant action.

Dr. Tatsuya Kanai, a research worker collaborating with Professor Wang, localized the central vocalization mechanism in the brain stem and its descending pathway in the medulla oblongata of the cat. Dr. H. H. Wang, Dr. Kanai and Dr. Shirley J. Markee, a post-doctoral trainee, have improved the technique of cross circulation in dogs. Thus, less than one per cent of a dose of I_{131} injected into the donor circulation passes into that of the recipient

animal in thirty minutes. With this improved method, it was found that reserpine in doses as high as one mg/kg, given to the donor animal and perfused through the head circulation, has no depressant action on the central vasomotor mechanism of the recipient animal. This evidence suggests that the hypotensive action of reserpine is largely peripheral. Dr. Marvin R. Blumenthal, a volunteer investigator in the department, designed a special cannula which can be inserted into the ascending aorta to form an isolated pouch. Drugs injected into this pouch will perfuse all branches of the coronary arteries. With this method the effects of a number of drugs, vasoconstrictor as well as vasodilator, on the coronary flow and cardiac dynamics can be investigated.

Several investigators worked in close association with Professor Wang. Dr. Norman Kahn, a post-doctoral trainee, investigated the descending pathways of the medullary respiratory mechanism. The results indicate that the pathways descend in the spinal cord on the homolateral side. Dr. James J. Lewis, another post-doctoral trainee, studied the potencies of various phenothiazine compounds as adrenergic blocking agents. Mr. Elliott Mills, a third year graduate student of the department, compared the cardiovascular effects obtained by stimulating the two sides of the medulla oblongata.

Drs. Shih-hsun Ngai and Gabriel G. Nahas, both Associate Professors of Anesthesiology and Associate Attending Anesthesiologists, and Dr. Donald L. Katz, a former postdoctoral trainee and now an Associate in Anesthesiology and Assistant Attending Anesthesiologist, have investigated the effects of THAM (2-amino-2-hydroxymethyl-1, 3-propanediol) on the central respiratory mechanisms in the cat. It was found that this amine buffer profoundly affects the pulmonary ventilation, and that the respiratory center became less responsive to facilitatory impulses.

Dr. H. S. Fang, Professor of Physiology in the National Taiwan University, and a Fellow of the China Medical Board of New York, Inc., studied the liberation of antidiuretic hormone following hypothalamic stimulation. He is also investigating hypothalamic cardiovascular responses.

Dr. Rudolph P. Bircher is continuing his investigation of the cardiac arrhythmias induced by convulsive doses of pentylenetetrazol or picrotoxin. It was found that they can be prevented by various anticonvulsants such as trimethadione and 3-methyl-5,5-phenyl ethyl hydantoin (Mesantoin) and also by various ganglionic blocking compounds such as tetraethylammonium and hexamethonium.

Members of the staff participated in several international scientific meetings. Professor Sawyer attended the Third International Symposium on Comparative Endocrinology held at Oiso, Japan, in June. He was a speaker at the Symposium on Neuroendocrinology at Miami. Professors Bartelstone, Sawyer, van Dyke, and Wang attended the First International Pharmacological Meeting in Stockholm, where papers were presented by Professors Sawyer and Wang. Professor Bartelstone spoke on the evaluation of clinical studies with stannous fluoride dentifrices at a symposium in Zürich, Switzerland, organized by a division of the Zahnärztliches Institut.

Professor van Dyke was elected President-Elect of the American Society for Pharmacology and Experimental Therapeutics. He will assume the presidency of the Society in 1962.

A number of foreign visitors met with the staff and discussed methods of teaching and problems of research. Professor van Dyke was appointed chair-

man of a committee to revise the pharmacopoeia of the Presbyterian Hospital.

Without generous grants and contributions, the investigative work of the staff and the support of graduate and postgraduate study would have had to be greatly curtailed. The National Institutes of Health of the United States Public Health Service not only granted generous funds for graduate and postgraduate training but also gave long-term support to the research projects of each member of the professorial staff. Research grants also were made by the United States Air Force and the National Science Foundation. The China Medical Board of New York, Inc., aided in the cost of research by a fellow, Dr. H. S. Fang. Appreciation also must be expressed for the generous support of training and research in the form of gifts from the Charles Pfizer Co., E. R. Squibb and Sons, and Sandoz Pharmaceuticals.



Physical Medicine and Rehabilitation

ROBERT C. DARLING

*Baruch Professor and
Chairman of the Department
Director of Service*

In the year 1961, the construction of the new eighth floor of the Neurological Institute was essentially completed and will be opened in January 1962. Prior to the construction, detailed plans were developed by the architects in collaboration with an active staff committee, all of this designed to utilize to the utmost the limited space available and to incorporate as many special features as possible to meet the goals of the unit. These goals can be summarized as the development of: living facilities for sixteen patients in whom a program of maximum rehabilitation effort can be smoothly carried out, modernly designed comprehensive therapy facilities for these patients as well as for those elsewhere in Neurological Institute and a teaching and research orientation for physicians and other rehabilitation personnel.

The medical students' orientation to physical medicine and rehabilitation in their third year was re-designed. Originally this was an unstructured tour of rehabilitation facilities. Instead it was set up this year as a series of eight formalized demonstration projects which small groups of the students visited

in turn. Demonstrations were conducted by the several rehabilitation professionals. The demonstrations were preceded several days earlier by an organized lecture on the type of material which was to be demonstrated. Fourth year teaching of rehabilitation continues to be coordinated with the students' group clinic experience utilizing patient material from the students' own patients.

The program for in-service education of hospital therapists has been significantly strengthened. Miss Signe Brunnstrom has been employed one day a week to supervise the clinical application of advanced kinesiological principles in the treatment areas on selected hemiplegic patients. A regular schedule has been set up to allow working therapists to attend specialized courses given in New York on chronic disease care, amputee management, etc.

The number of graduate physicians in training in the specialty has been four. The second residency position has been authorized with the opening of the new unit and it is hoped and expected that the new unit will greatly strengthen the traineeship program.

Dr. Nathan Kaplan, having completed the residency training program, joined the full-time attending staff as Assistant Physician in the Hospital and Instructor in the College of Physicians and Surgeons. Dr. Kaplan has been active in the development of special splints for the correction of deformities due to spasticity.

Professor Darling gave a lecture and clinical session at the Buffalo Veterans Administration Hospital on May 14, 1961. He also attended a teaching seminar sponsored by the Office of Vocational Rehabilitation at Baylor University Medical School in Houston, Texas, March 21-25, 1961. He is Chairman of the Executive Committee of the New York Society of Physical Medicine and Rehabilitation and Chairman of the Program Committee of the American Academy of Physical Medicine and Rehabilitation and has been appointed member of the Board of Directors of the Bureau of Applied Social Research. Dr. Morton Hoberman is Vice-President of the American Academy of Cerebral Palsy.

Mrs. Selma Bornstein, Assistant in the department, resigned and was replaced by Miss Marjorie Kellogg.

A Social Service training unit for social case work in Rehabilitation was established by the New York School of Social Work in the Medical Center, closely integrated with the department and service. This unit, supported by a grant from Office of Vocational Rehabilitation, is under the direction of Mrs. Elinor Stevens of the faculty of the New York School of Social Work with headquarters at the Medical Center.

During this year 55,601 patient visits were made to the department and a total of 95,069 treatments were given. Of this latter total, 9,550 were occupational therapy and 84,519 were physical therapy. Forty percent of the treatments were to clinic patients, twenty-five percent to private patients, twenty-five percent to ward, and ten percent to semiprivate patients.

Occupational Therapy Courses

The number of registered students for the 1961-62 year showed a slight increase from fifty to fifty-three, including those in both the academic and clinical aspects of education. Fourteen students graduated in 1961 and passed the registration examination of the American Occupational Therapy Association.

The enrollment continues to reflect the intensive public education and recruitment program spearheaded by Mrs. Adelaide H. Deutsch. For the third successive year the summer work experience in occupational therapy was made available to college students in 1961. Twenty-two students, represent-

ing sixteen colleges were placed in fifteen hospital departments of occupational therapy for two months of on-the-job experience. This is an important recruitment tool, as indicated by the registration in our present student body of six former summer experience Students.

Effort has been continued toward improved coordination of course offerings. One new course concerned with rehabilitation aspects of activities of daily living and pre-vocational evaluation will be introduced into the Certificate program in the Spring of 1962. Miss Thelma Wellerson will develop and instruct the course. The general clerkship was reorganized by Miss Dorothy H. Ericson to include experience with the blind and deaf, with children and the aged, as well as general hospital ward programs. There is a recognized need to introduce the certificate students to more patient contact in the academic phase of their program. Long term plans for the centralization of the programs at the Medical Center will make this possible.

During the 1961-62 academic year, thirty-two students were placed in clinical affiliations in four psychiatric hospitals, in nine physical rehabilitation programs, and in nine general hospitals (including tuberculosis programs).

The staff of Columbia University Occupational Therapy courses met with the clinical supervisors in March 1961 at the meeting of the Joint Council on Student Affiliations. Professor Martha E. Schnebly and Miss Naida Ackley, Director of Occupational Therapy, New Jersey State Hospital, attended and reported on the two meetings of the American Occupational Therapy Association Committee on Student Affiliations. Miss Ackley serves as the elected representative of the Columbia University Student Affiliations Council.

Miss Caroline E. Henderson, Director of Occupational Therapy, Royal Mental Hospitals, Edinburgh, Scotland, was appointed as a Visiting Fellow for the six month period January through July 1961. Through the courtesy of Dr. Lawrence C. Kolb, Professor of Psychiatry and Director of Psychiatric Service, she worked part-time in the occupational therapy department of the New York State Psychiatric Institute.

The occupational therapy program was once again the recipient of a grant from the Office of Vocational Rehabilitation. Of the thirty-two applicants accepted in the occupational therapy program this year, eleven had been contacted by Mrs. Deutsch in their colleges. In addition, visits were made by Mrs. Deutsch to twenty-seven four-year colleges or universities, and eight junior colleges. Conferences

were held with eighty-nine faculty members in these schools and approximately 1,735 students were contacted individually or in groups.

Physical Therapy Courses

During the year thirteen advanced standing students received Certificates of Proficiency in Physical Therapy and nine students were awarded the degree of Bachelor of Science. The above brings the total of graduates to 504 since the beginning of these courses. Approximately forty-five percent of the student body is receiving financial assistance from some eleven sources.

The present thirty-eight students are either graduates or transfer students from thirty-two colleges and universities. Although the majority of students are from New York and nearby states, all parts of the country are represented.

There is much controversy among schools of physical therapy relative to the need for continuance of the intensive one year course in physical therapy for college graduates (advanced standing program). There is no question among the staff of this department regarding the continuance of this program at Columbia. Very well qualified candidates apply and in sufficient numbers to warrant continuance of the course. Of the fifty applications received for this year, twenty-three were for the Certificate program and twenty-seven for the degree courses.

Recruitment efforts have continued as formerly with participation by students and staff in several

career day activities. Recruitment efforts by Mrs. Deutsch although administered under occupational therapy have influenced favorably the physical therapy enrollment.

The major change which has taken place in the curriculum effects the degree program. The students are now required to take a year's course (6 points), in place of a 2 point course, in the structure and function of the nervous system. Plans are developing to give greater emphasis and increased knowledge and experience to the students in the area of public health services and home-care plans. These services are rapidly expanding so that physical therapists are becoming more involved each year.

A Kinesiology Manual for Laboratory Instruction is in the hands of a publisher and will be ready for distribution by next Fall. Miss Signe Brunnstrom, the author, prepared this under a grant from the Office of Vocational Rehabilitation in 1959. Mimeographed copies served as a "trial run" with a class of students for one year before making final revisions and additions for the printed manual.

The Office of Vocational Rehabilitation awarded a grant for the development of a guidance manual relating to the clinical practice phase of the educational program of the student physical therapist. Professor Ruth Dickinson and Miss Rosemary Scully, clinical supervisor of students, with Professor Mary E. Callahan serving as project director, are presently engaged in collecting and reviewing data for this project.

Physiology

WALTER S. ROOT

*Professor and Acting
Chairman of the Department*



During the past year several changes in personnel have occurred. In January, 1961, Dr. Raimond Emmers from the laboratory of Neurophysiology of the University of Wisconsin was appointed an Assistant Professor. Dr. Elizabeth Carlsen Gerst, Instructor, was promoted to an Assistant Professorship on July first. Dr. Richard C. Mason, formerly of the Department of Physiology at Seton Hall College of Medicine and Dentistry, was appointed Assistant Professor of Physiology (Urology). Dr. Martin Mendelson of the California Institute of Technology joined the Department as Research Associate affiliated with Professor Werner R. Lowenstein's Laboratory. Dr. Branko Peric, Dozenti in the Medical Faculty of the University of Sarajevo (Yugoslavia) has received a United States Public Health Service Post-doctoral Fellowship and is working under the direction of Professor Magnus I. Gregersen.

The training program for graduate students and post-doctoral fellows in physiology continues to be directed by Professor William L. Nastuk. An innovation has been the weekly seminars in collaboration with the Department of Pharmacology.

Professor Gregersen, Professor Shu Chien, and Dr. Charles Pallavicini have completed a study on the chemical composition of brain tissue and its change due to X-irradiation and disturbances in fluid balance. They have also obtained data on the chemical composition of various specific areas and structures of the brain in the dog and monkey. With Professor Louis I. Cizek they have carried out a study of the effects of disturbances in water and electrolyte balance on the chemical composition of brain tissue in dogs. Professors Chien and Gregersen have contributed a chapter on the determination of body fluid volumes to physical techniques in biological research, edited by Professor Nastuk.

Professor Nastuk has continued his studies on myasthenia gravis. This work has been concerned with the changes produced by thymectomy, and those occurring during spontaneous exacerbations and remissions. He has been aided in the collection of blood samples and the clinical evaluation of patients by Dr. Maxcy Jean Smith. In connection with this study Dr. Harry A. Kessler, United States Public Health Service post-doctoral trainee, has used the

immunofluorescence technique to detect myosin binding globulin constituents. The effect of myosin binding globulin on the reaction to ATP in glycerinated muscle fibers has been studied by Richard Murphy, United States Public Health Service pre-doctoral trainee. Arthur Manthey, also a pre-doctoral trainee, is investigating the changes in endplate membrane sensitivity to acetylcholine produced by the serum globulin of patients suffering from myasthenia gravis. Under the direction of Professor Nastuk, Dr. A. Weber of the Institute for Muscle Disease, New York City, and Miss Bella Tabak, pre-doctoral trainee, are studying the binding of fluorescein tagged globulin of myasthenia patients to myosin in solution and to cardiac muscle myofibrils. Miss Tabak is also investigating the binding of serum complement by the myosin-globulin complex utilizing globulin for myasthenic patients.

Professor Nastuk is continuing his studies on the fundamental aspects of neuromuscular transmission. In collaboration with Dr. Hans Karis, Associate in Anesthesiology and Assistant Attending Anesthesiologist, he is determining the nature of the neuromuscular block produced by hexafluorenum, and with Dr. Paul J. Poppers, the neuromuscular block produced by thiamine and one of its analogues.

During the summer Mr. Philip Rogal, now a second year medical student, worked under Professor Nastuk's direction on the response of the clam heart to acetylcholine.

Professor Cizek and Professor Mero Nocenti are studying the effects of estrogens on electrolytes and water balance in the rat. In collaboration with Professor Chien and Dr. Zacharias Dische, Professor of Biochemistry (Ophthalmology), Professor Cizek is investigating the nature of the glycoproteins of submaxillary saliva.

The sensory physiology group under the direction of Professor Werner R. Loewenstein continued its research on receptor mechanisms. Several clues on biological transducer mechanisms were obtained. Professor Loewenstein has worked out the first transfer-membrane area relationship of a receptor membrane. His results in Pacinian corpuscles show that the area of receptor membrane excited is the main factor, if not the only one, in determining the frequency coding of sensory nerve impulses. Dr. Nobisada Ishiko, visiting scientist from Kumamoto University, Japan, and Professor Loewenstein have studied some aspects of the thermokinetics of the receptor process. They showed that the amount and the rate of charge transfer through the receptor membrane increases markedly with temperature. A high potential energy barrier appears to be asso-

ciated with the initiation of the receptor process. Dr. Sidney Socolar has analyzed the after-effects of repeated charge transfer through the receptor membrane. The following picture on mechano-receptor excitation has emerged from the studies of the group. The receptor membrane separates two media of different ionic concentrations. Mechanical stimulation causes the conductance of the receptor membrane to increase in a relatively non-selective manner, and ions to flow through it along their electrochemical gradients. An activation energy barrier of about 16,000 cal/mole limits this process.

Dr. Kashima Goto, visiting fellow from Gunma University, Japan, and Professor Loewenstein have found that besides the well-known large afferent axon, a small non-myelinated accessory axon enters the Pacinian corpuscle. This axon appears to be efferent; its function is currently under study. Dr. Charles R. Noback, Associate Professor of Anatomy and Professor Loewenstein are now collaborating in a morphological study of this fiber.

Professor Loewenstein and Dr. Ishiko have worked the last two summers at the Woods Hole Marine Biological Laboratory on the transducer mechanisms of a primitive sensory receptor, the Lorenzian ampulla of elasmobranchs. This receptor is highly sensitive to osmotic pressure changes. Because of its extraordinarily large size, this receptor promises to become a valuable tool for the study of transducer mechanisms. Dr. S. Fischer, visiting scholar of the University of Chili, and Professor Loewenstein have looked into the possible physiological role of the receptor. Their denervation studies indicate that the receptor forms part of a system of internal osmo-regulation.

Professor William W. Walcott reported at the Federation Meetings on some aspects of his collaborative work with Dr. Robert A. Phillips of the Naval Medical Research Unit number 2 at Taipei. These studies, which were carried out during Professor Walcott's sabbatical leave, were concerned with the elucidation of the mechanism of the diarrhea of cholera.

Professor Nocenti and Dr. Charles A. Furey, Assistant in Urology and Assistant Urologist, were awarded a Merck, Sharp and Dohme Research Gift for the study of the effect of cortical hormone and other compounds on experimental granulomas. During the past summer Professor Nocenti supervised work done by three dental students. These studies were concerned with steroid and enzyme influence on the biochemistry of experimental granulomas (Gerald Lederman), salt and water balance in the adrenalectomized-ovariectomized rat (Albert Zengo),

and the direct effect of estrogen on the rat ovary (Herbert Rod).

Professor Chien and Dr. Shunichi Usami from Mie Prefectural University, Tsu, Japan, have attempted to correlate the inactivation of the anti-diuretic hormone by the liver with hepatic blood flow. With Professor Gregersen, they have studied the time course of the secretion of aldosterone after hemorrhage. During the past summer this work was aided by Peter S. Chen, first year medical student. Dr. Usami has studied the rapid determination of aldosterone with glass fiber paper chromatography. Also, during the summer two dental students, Michael Schwartz and Joel Hauptman, joined Professor Chien in studying the changes in hepatic blood flow and splanchnic blood volume after hemorrhage in sympathectomized and non-sympathectomized dogs.

Professor Gerst, in collaboration with Professor Walter S. Root and Drs. Charles Wolf, Instructor in Anesthesiology and Assistant Anesthesiologist, and Yousif-Al-Naaman, Research Associate in Surgery, has continued studies on the effectiveness of hypoxia in eliciting sympatho-adrenal activities in dogs with chronically denervated hearts. Some factor other than hypoxia appears to be responsible for the sympatho-adrenal activity frequently noted in animals exposed to low oxygen. Currently the rate of the denervated heart is being compared with fluorimetrically measured plasma levels of epinephrine and norepinephrine.

Dr. Martin Blank has continued his research on the factors involved in membrane permeability using a monolayer model. He is also interested in the properties of charged monolayers, since these are of value in understanding ion transport across membranes. Dr. Blank was given a leave of absence during the fall months to work in Professor F. J. W. Roughton's Department of Colloid Science at Cambridge University. Dr. Colin Fell has devised a method to measure changes in the distribution of body weight as an index of alterations in fluid distribution. In collaboration with David Fogelson, a second year dental student, he has studied the effects of decerebration on the cardiovascular responses to postural changes.

Professor Robert J. Dellenback, working with Dr. David A. Ringle, United States Public Health Service post-doctoral Fellow, has investigated the effect of various factors on the metabolism of male rat cerebral cortical slices. The work has been extended to other species including the Mongolian Gerbil, an animal which is new in this country. During the summer they were joined by Norman Spen-

cer, a first year medical student.

Professor Emmers is currently organizing a laboratory for the study of the neurophysiology of taste. He spent the summer months at the University of Wisconsin working with Professor Clinton Woolsey on a stereotaxic atlas of the brain of the Squirrel monkey.

Professor Gregersen attended a conference on shock at Walter Reed Hospital, Washington, presented a paper on fluid replacement in shock at the Ciba International Shock Symposium in Stockholm, and was present at the Radiation Research meetings held in Washington.

Professor Loewenstein lectured at the University of West Berlin, at the University of Freiburg, and at the University of Turin. He was also guest lecturer at the University of California, Los Angeles; at New York University; and at the Marine Biological Laboratory, Woods Hole. He participated in the International Symposium on Peripheral and Central Nervous Function, held in Turin under the sponsorship of the International Society of Neuro-Vegetative Research.

Professor Root continued to serve as Secretary-Treasurer of the Society for Experimental Biology and Medicine, and managing editor of the proceedings of this Society. He was appointed Chairman of the Medical Science Screening Committee, Committee on International Exchange of Persons (Fulbright), and was elected a Vice-President of the New York State Society for Medical Research, and Vice-President of the Kappa Chapter of Sigma Xi. During the year he continued to act as Chairman of the Committee on Animal Care, served on the Membership Committee of the American Physiological Society, and completed his term as a member of the Physiology Test Committee of the National Board of Medical Examiners.

Professor Nastuk continued to serve on the Editorial Board of Physiological Reviews and as a member of the Physiology Study Section of the United States Public Health Service. Recently he became a member of the Medical Science Advisory Board of the Columbia University Press.

Professor Cizek organized a course in applied physiology and was guest lecturer in the graduate medical training program at Seton Hall University.

Professors Gregersen, Root, Cizek and Nocenti contributed to the 11th edition of Bard's Medical Physiology which appeared during the past summer.

Departmental research has been supported by grants made by the United States Public Health Service, the National Science Foundation and the Merck, Sharp and Dohme Co.



Psychiatry

LAWRENCE C. KOLB

Professor and Chairman of the Department · Director of Service

Professor George E. Daniels, Director of the Columbia Psychoanalytic Clinic, retired on June 30, 1961, after thirty-three years of service in the Medical Center. Professor Daniels was among the early pioneers in the field of psychosomatic research in the Medical Center. With Dr. Nolan D. C. Lewis, Professor Daniels laid the groundwork that led to the establishment of the Columbia Psychoanalytic Clinic for Training and Research as a division of the Department of Psychiatry and the establishment of the Psychosomatic Service at the Presbyterian Hospital. He became Director of the Columbia Psychoanalytic Clinic on July 1, 1957, serving in this capacity until his retirement when Professor George S. Goldman assumed the position as Director of the Columbia Psychoanalytic Clinic.

The Foundations' Fund for Research in Psychiatry awarded the department an endowment fund to establish a research professorship in psychiatry. The award was made for the specific purpose of engaging Professor Ernest M. Gruenberg in full time investigation in the area of epidemiology. He assumed the post on October 1, 1961.

Dr. George H. Wilkie was awarded a Career Investigator Grant by the National Institutes of Mental Health, and Dr. Robert L. Spitzer received a Special Research Fellowship from the same Institute. Both completed their training as psychiatric residents here in July. Dr. Donald S. Kornfeld continues for a second year on his Career Teacher Grant from the National Institutes of Mental Health.

Professor Morris Zelditch Jr. resigned his posi-

tion as of July 1, 1961, to accept an appointment as an Associate Professor of Sociology at Stanford University. Mr. Jay Schulman, who had been Professor Zelditch's assistant, has assumed his duties.

In the Columbia Psychoanalytic Clinic the following physicians, all Clinic graduates, joined the staff this year. They were Drs. Eugene Forster as coordinator of the third year clinical conferences; Sheldon G. Gaylin as a supervisor on the admissions service; and Aaron Stern as a supervisor on the reparative service. Four Clinic graduates were appointed training and supervising analysts; Drs. Max Cohen, Arnold Cooper, Samuel Feder and Willard Gaylin. Three additions to the collaborating staff for the State Hospital Training Program were made: Drs. Edgar H. Auerswald, Martin Barad and Victor Teichner. Visiting Professor Frank Reissman, Associate Professor of Psychology at Bard College, is with the Clinic for the academic year 1961-62 on a grant from the National Institutes of Mental Health.

The department has been saddened by the death of Dr. Blaise Pasquarelli. The following resignations have occurred during the year: Dr. Howard R. Stanton, Research Associate; Dr. Arthur Peck, Instructor and Assistant Attending Psychiatrist, Vanderbilt Clinic; Dr. Samuel Feder, Instructor; Leonard R. Sillman, Associate; Mr. Stanley J. Applebaum, Assistant; Dr. Pierre Lacombe, Assistant Attending Psychiatrist, Vanderbilt Clinic; Dr. Dennis Horvath, Assistant Psychiatrist, Vanderbilt Clinic, and Martin Schreiber, Associate Attending Psychiatrist, Vanderbilt Clinic. Dr. Lawrence S. Kubie, after many years of service with the Neurological Institute and more recently with the Department of Psychiatry.

The following joined the staff during the year: Drs. Donald D. P. Clarke, Doris H. Clouet, Mark Flapan, Joseph Jaffe, Amos Neidle, and Katherine Sohler as Research Associates; Drs. DeWitt Crandell, Gurston Goldin, Peter Laderman, Robert L. Spitzer, Lawrence C. Thum, Victor Teichner and George H. Wilkie as Instructors; Dr. Auerswald as Lecturer; Mr. Irvin Leitner as Assistant; and Margaret Neubart as Administrative Assistant. Dr. Estelle Boynton, Assistant Attending Psychiatrist, and Drs. Douglas B. Hansen, Winfred Overholser, and Jerry M. Wiener, Assistant Psychiatrists, joined the staff of the Vanderbilt Clinic.

At Mt. Sinai Hospital, Drs. Hans J. Kleinschmidt and Harry Diener were appointed Instructors, and Dr. Louis Linn was promoted to Lecturer. Professor Harry I. Weinstock was appointed Consultant in Psychiatry at the Mt. Sinai Hospital.

Services to Patients

Among the important innovations for patient management has been the effort made during the past year in the Vanderbilt Clinic and at the Psychiatric Institute to avoid the unnecessary reduplication of diagnostic study and delay in treatment for patients who require care in the hospitals of the New York State Department of Mental Hygiene. In the past all such patients were required to be transferred for legal certification to the Bellevue Hospital Psychiatric Division. By encouraging the signing of voluntary admission papers and through the direct transfer on the various physician's certificates now authorized by law, it has been possible to send the majority of seriously ill directly to state hospitals, circumventing the transfer through the municipal hospitals.

The outpatient service in the Vanderbilt Clinic has been a steady growth in the Continuation Clinic organized and supervised by Professor James Cattell. This service cares for a large number of patients who require sustained contact over time, supplemented in many instances with the use of drugs, without intensive or probing psychotherapy, and where the aims of treatment are limited to the sustaining of social functioning, effective defenses and symptomatic relief. This year this clinic registered 386 patients. The operation of the consultation service in the Presbyterian Hospital has been reorganized under Professor Shervert H. Frazier as Chief of Service.

Teaching

Without question, the most striking innovation in the educational activities of the department during the year has been the utilization of the closed-circuit television equipment of the Behavioral Laboratory at the Psychiatric Institute. This equipment now provides to the department the means of bringing concretely to the medical students, psychiatric residents, or other postgraduate trainees presentations of diagnostic and therapeutic activities conducted by senior members of the faculty which were never possible in the past. The success of the trials in the instruction of residents was sufficiently great so that television instruction on the psychotherapeutic process was initiated in September to the fourth year medical students.

An attractive brochure describing the various programs of instruction at the postgraduate level given at the New York State Psychiatric Institute by the faculty, entitled "Training in Mental Health Specialties," was printed this year and made available through the Columbia University Press.

The departmental Committee on Education of Related Professions submitted a lengthy report, through its chairwoman, Dr. Elizabeth B. Davis, on the psychiatric educational contributions to the School of Dentistry, Department of Nursing, Department of Physical Medicine and Rehabilitation, the hospital Social Service Department, the chaplaincy training program, and the clinical psychology division of this department. The committee stressed the need to design the curriculum of psychiatric content for each related profession for the particular functions of that discipline and not, as has often been done in the past, reproduce methods and content originally given for the purposes of medical education.

A formal teaching program was instituted for medical students engaged in research in the department during the summer of 1961 by Professor Joseph Schachter. Seven students from the college and six students from other medical schools participated in a series of weekly seminars at which each student presented a paper describing his research project. A discussant selected from the faculty as well as staff members of the Medical Student Research Committee discussed each presentation with the group of students. With Professor Schachter, several of the students produced a movie, "Physiological Correlates of Perception," which will be included in the medical student teaching program.

The Psychoanalytic Clinic now enrolls for the first time first year residents at the New York State Psychiatric Institute in the course "Psychodynamics and Psychopathology." At the same time a new teaching method for the psychodynamics course had been planned by Dr. Arnold Cooper and Professor Aaron Karush and was introduced this year.

A generous bequest from the late Adele Levy, wife of Dr. Levy, has enabled the Department of Psychiatry and the Clinic to establish for their students the Adele Levy Loan Fund. Students needing funds to assist them with their training may borrow \$2,000 a year and up to \$6,000 during the course of their training. The Clinic also received a \$25,000 Fluid Research Fund from the bequest. The fund will be used to support ongoing and new research conducted by Clinic staff members.

At the Mt. Sinai Hospital, Professor M. Ralph Kaufman and his colleagues have modified the course in basic psychiatry for general practitioners established three years ago in affiliation with the department.

Research

The study of disturbances in perception and con-

ceptualization in eating disorders and schizophrenic development was continued by Professor Hilde Bruch. It appears that a relationship may be established to a deficit early in life, inappropriate response to child-initiated behavior, resulting in falsified awareness of bodily sensations, body concept and identity. These theoretical foundations were applied in psychotherapy with considerable success.

Professor Schachter completed a report on this study of digital vascular resistance in neonates. Mr. Thomas A. Williams, a Post-Sophomore Research Fellow, United States Public Health Service, completed an investigation of iontophoresis of nor-adrenalin. Dr. Jean Jameson and Dr. Judith S. Schachter conducted follow-up home visits of several of the infants studied physiologically in this laboratory. In addition, they developed rating scales to be used in a longitudinal study of child development. Dr. David E. Sobel, assisted by Dr. John M. Price, has continued his research on the maternal behavior of schizophrenic mothers towards their infants. The data suggests that when entering the acute phase of their schizophrenic illness such mothers play with their infants relatively little, evince minimal pleasure in response to their infants' activities, and may elicit depressions in their infants via "a process of contagion." Dr. Winslow Hunt, a third year resident working with Dr. Sobel, is exploring the possibility of keeping infants with schizophrenic mothers when the latter require hospitalization to study the parent-infant interaction in detail.

Dr. John F. O'Connor is currently occupied with studies in both ulcerative colitis and lupus erythematosus. In the ulcerative colitis study, fifty-eight psychoanalytically or psychotherapeutically treated cases are matched to a control group of fifty-eight non-psychiatrically treated cases. In this study group there seems to be a direct correlation between psychiatric diagnosis and eventual prognosis. In the lupus erythematosus study there has been an evaluation of 159 cases seen at the Medical Center, taking into account premorbid personality development, course and prognosis of the psychosis. Results confirm the earlier study of forty cases. Severity of basic disease processes seems to be directly related to the development of the psychosis.

Professor Roger MacKinnon, with the assistance of Drs. Ivan Goldberg and George Papanek, second year residents, is organizing a research study of the psychodynamics of the psychiatric emergency, utilizing the patients seen in the Vanderbilt Clinic Emergency Room.

Professors Daniels, Karush and Leon Moses, with Dr. O'Connor, continued their follow-up study of

cases of ulcerative colitis treated at the Medical Center, in collaboration with the Department of Medicine. The psychiatric diagnoses in the psychiatrically treated cases proved to be the most reliable indicator of prognosis, both of the mental and physical response. More than half of the cases coming to operation and almost two thirds of those who died were diagnosed schizophrenic, while schizophrenics comprised only one third of the total group.

Professors Karush and B. Ruth Easser, Dr. Cooper and Mrs. Bluma Swerdloff, social worker, continued work on their ego strength project. They have developed a scale for the evaluation of ego strength — a criteria for accurate measurement of the capacity of a patient to undergo significant change during psychoanalytic treatment.

Professor Goldman and Drs. Daniel Shapiro, Alvin Polatin, and David Jaffe continued work on their project, "Interviewing Technique; Study of Interviews in a Group Setting."

Professor Henriette R. Klein has pursued work on her project "A Comparative Study of Trainees and Their Development During the Training Period: An Assessment of Selection Procedures." The clinical ability and skills of a five year sample of trainees (as measured by evaluations and achievements during and after training) was compared with their admission interview ratings, psychological test results, previous academic status, and specific personality characteristics. Professor Klein completed a "Confidential Report on Selection Procedure: 1961-62," a validation study of the selection interviews of applications for psychoanalytic training, which examined the differences in appraisal between these interviews and the psychological examinations. Professor Klein began work on a study of attitudes towards termination of psychoanalytic treatment.

Dr. Joseph M. Lubart completed his comparative study of emotional disorders in toxic and non-toxic goiter. The comparison of personality disturbances between patients with histories of toxic and non-toxic goiter revealed a high incidence of severe early affective deprivation in the forty-eight cases of both groups in the study.

Professor Riessman, while with the Clinic, will pursue his research on therapy for people from disadvantaged socio-economic groups, as well as acting as a consultant on methodology for ongoing and new research projects conducted by Clinic staff and candidates.

Dr. Herbert Hendin is working on his cross cultural study of the problem of suicide in the Scandinavian countries. He is focusing on both the sui-

cide rate and the different psychosocial problems and character structure of the people in these countries. Denmark and Sweden, with high suicide rates, have been studied, and Norway, with a low suicide rate, will be studied during the summer of 1962. Dr. Hendin is also working on a project evaluating the suicidal motivation of patients in the United States, using hypnosis in evaluating motivation and intent.

Drs. Hendin and Willard Gaylin are doing preliminary work on a project involving psychoanalytic interview technique with 'non patients' to see how valuable a source of information they can be, both as a source of comparison with patients and as a source of information in cross cultural studies.

Professor Lionel Oversey is writing a preliminary report in collaboration with Drs. Gaylin and Hendin on a long term project studying the psychotherapeutic management of male homosexuality.

At the Henry Httleson Center for Child Research, Professor William Goldfarb is continuing his investigation of childhood schizophrenia. Plans for the longitudinal study of schizophrenic children in treatment for evaluation of day versus inpatient treatment of schizophrenic children have been completed. A manual for family adequacy scales is in preparation and an analysis of interactions between schizophrenic children and their mothers is in preparation.

Dr. Bernard B. Schoenberg and Professor Arthur Carr, in a study of brief psychotherapy for patients with neurodermatitis, have obtained preliminary findings which indicate that approximately fifty per cent of the referred patients have been significantly relieved of their symptomatology in the course of a directive twelve session course of treatment. Patients responding to this form of treatment appear to be differentiated from non-responders on the basis of their reactions to projective tests.

Professor William N. Thetford, in collaboration with Dr. Helen Schucman, was awarded a grant by the Human Ecology Fund for a study of Gittinger's personality theory in patients with different symptoms, which was completed during 1960. Several hundred subjects, including conversion hysterics, migraine sufferers and ulcer patients were studied. In connection with the conversion hysterics, the results demonstrated that sensory and motor symptoms are significantly more characteristic of externalizers, while headaches are significantly more characteristic of internalizers. Also in accordance with theoretical expectations, patients with migraine were found to be both significantly more rigid and less socially acceptable than were the ulcer group.

In the Division of Community Psychiatry the study of psychogenic female infertility in relation to adoption was initiated during the year by Professor Viola Bernard and Dr. Flapan.

Dr. Bruce P. Dohrenwend has continued the following studies at the Community Psychiatry Research Unit, which were begun under the Columbia-Washington Heights Community Mental Health Project. A study of the appraisal of problems of mental disorder by community leaders has been completed. One of the main results indicates that orientations toward mental disorder vary greatly with the order of activity in which a leader holds his primary position of influence. Another important set of findings have to do with the way leaders from the socially and economically more disadvantaged groups evaluate problems of mental disorder. Preliminary work has been done as well by Dr. Dohrenwend toward a plan of analysis for social and psychiatric data from a survey of a probability sample of 4,500 households. Additional work has been done on a stress situation brought about by the forced relocation of 1,800 families who found themselves in the path of improvements being made in the Washington Heights approach to the George Washington Bridge.

Dr. Robert Silbert has completed a study entitled "Some Problems of the Admission of Psychiatric Patients to a Medical Center with Complete Psychiatric Facilities." This was a study of patients who appeared at the emergency room of a large medical center and who were not accepted for treatment to any of the clinics. The findings indicated a significant percent of these patients had a recognizable psychiatric syndrome, only some of which was diagnosed on the initial visit.

Miss Violet Bemmels is working on the Community Agency Survey of the Columbia-Washington Heights Community Mental Health Project. The objectives of this survey are a study of the prevalence of emotional disturbance in the clients of two public and thirteen private agencies functioning in the study zone and willing and able to submit the lists of their clients living in that zone, and the adequacy with which the known and suspected needs are being recognized and met by the community resources.

Mr. Jay Schulman of the Sociology Division is completing an analysis of his study of the Psychiatric Institute, conceived as a study of the organizational characteristics of a highly professionalized mental hospital as they bear upon patient treatment, professional training, and production of new knowledge.

At the New York State Psychiatric Institute, the main effort in the Mental Health Project for the Literate Deaf of Professor John D. Rainer, Adjunct Professor of Statistics, W. Edwards Deming of New York University, Dr. Kenneth Z. Altshuler, Dr. Bruce Sarlin, Dr. Jane M. Weiss, Dr. Ionel Rapaport and Diane Sank was devoted to tabulation and assessment of data on the New York State population of deaf persons (including twins). In the survey, investigation of the siblings and parents of 138 deaf schizophrenics revealed no significant difference in schizophrenia risk either between hearing and deaf sibs, or between either group of siblings and comparable sibships of non-deaf schizophrenics. All sibship groups studied yielded significantly higher schizophrenia rates than the general population. The observed rates for the parents of deaf schizophrenics were in line with these findings.

In the study of 62 deaf twin index families, corroborative evidence was obtained not only for the existence of both dominant and recessive forms of early-onset deafness, but also for various degrees of expression especially in the dominant form. The need for distinguishing between exogenous and endogenous types of deafness for purposes of genetic counseling was clearly indicated.

In a project on the changing mating and fertility patterns in schizophrenic families, Professors Franz J. Kallmann and Deming and Drs. Arthur Falek, Charles Goldfarb, Edward V. Glanville and Loise Erlennmeyer-Kimling collected detailed information from the hospital records of over 1,600 schizophrenic index cases. In a preliminary analysis of marriage and fertility trends observed in two samples of schizophrenic patients hospitalized during the years 1934-36 and 1954-56, it was found that during the twenty-year period in question both pre- and post-psychotic marriage and reproductive rates increased among schizophrenics, and that the relative rates of increase exceeded that of the general population of the United States.

Clinical data collected in a study of the longitudinal study of senescent twins by Drs. Lissy Jarvik and Falek, and Professor Kallmann revealed that cancer, as a cause of death in the age group about 60, was as frequent in one-egg as in two-egg twins, while concordance for cancer was found to be higher in one-egg than in two-egg pairs, indicating the operation of some genetic factor in carcinogenesis. However, the rates themselves were low, a finding compatible with the assumption that cancer cases form a heterogeneous group.

Professor Carney Landis has completed a manuscript tentatively entitled "Varieties of Abnormal

Experience," to be published by Holt, Rinehart & Winston in 1962. The book, based on an extensive literature search, represents an annotated and ordered collection of excerpts from autobiographies of mental patients and thus includes many phenomenological descriptions of various subjective experiences.

Professor Landis, in an experiment on the measurement (estimation) of various bodily dimensions (height, width, depth, etc.), demonstrates that subjects are able to make reliable estimates of various bodily dimensions. A comparison of estimates obtained from schizophrenic patients and from normal subjects, however, showed no significant differences between the groups, suggesting that the estimation of the dimension of various parts of the body, obtained with a method of reproduction, does not directly relate to the psychodynamically relevant distortions of "body image" such as relative satisfaction or dissatisfaction.

Dr. Jacques Rutschmann has initiated a new study of flicker-fusion thresholds designed to compare schizophrenic patients and normal subjects, with the aim of testing some hypothesis derived from detection theory. Using the method of "forced choice," a relatively new psychophysical method, it was found that patients give highly reliable thresholds. The after-image disappearance test, a test reported to be sensitive to relatively small single dosages of various psychotropic agents, was further investigated by him. In a clinical study, acute male schizophrenic patients (off drugs) were compared to normal subjects. It was found that the schizophrenics ceased to perceive the primary image (or started to perceive the complementary image) at significantly lower light-intensities than the controls; that a single dose of 125 mg. of chlorpromazine had no measurable effect twenty-four hours after the administration of the drug, and that the test does not discriminate "reactive" from "process" type schizophrenics. These findings cannot be attributed to differences or changes in pupillary diameter, since a small artificial pupil was used.

Professor Heinrich B. Waelsch, with Drs. Soll Berl, Clarke, Dominick P. Purpura, Associate Professor of Neurological Surgery, and Genkichisoo Takagaki, a Fellow of the Rockefeller Foundation, continued the study of ammonia metabolism in brain. Elevated cerebral ammonia concentrations are removed by the formation of glutamine while in liver and glutamic-aspartic acids systems is the major removal mechanism for ammonia. Additional evidence for the compartmentation of glutamic acid metabolism in brain and liver was obtained.

Professor Waelsch, in collaboration with Drs. Isabel Wajda and Michael Ginsburg, Visiting Associate Professor of Pharmacology, College of Physicians and Surgeons, studied the effect of B. Pertussis vaccine and various bacterial toxins on transglutaminase activity in various animals. It was found that as a result of the administration of these toxins, the enzyme activity increases significantly, an increase which correlates with the ability of the liver to incorporate histamine into proteins *in vivo*.

Professor Waelsch, in collaboration with Dr. Doris H. Clouet, studied the return of cholinesterase activities in the nervous system of the frog after irreversible inhibition. It was found that the enzyme recovers in distal-proximal direction, an observation which appears to be in contradiction to the concept of axonal flow.

Professor Abel L. Lajtha has continued to investigate the movement of amino acids between brain and blood, and he has collected evidence of an active transport system responsible for the uptake of and release of amino acids from the brain.

Professor Warren M. Sperry has developed a procedure for the quantitative isolation of various lipid and protein fractions from the brain and has applied the method to a study of the metabolic stability of these fractions; he has found marked radioactivity still to be present as long as sixteen months after the administration of acetate-C¹⁴ to rats during early life. Also in his laboratories, with the aid of his procedure for three-phase counter-current fractionation, Professor Herbert L. Meltzer has detected the presence of unsubstituted amines in preparations of gangliosides from brain, and he obtained evidence for the existence of surface barriers which severely limit the extractability of lipids from aqueous dispersions into heptane. Professor Benjamin Weiss has studied the biosynthesis of sphingosine and phytosphingosine and the chemical synthesis of labeled sphingosine and long chain aldehydes. Professor George J. Alexander has found that the convulsant drug, metrazol, stimulates the rate of growth of mammalian cells cultured *in vivo*, while inhibiting cholesterol synthesis and the rate of oxygen uptake per cell, and that metrazol also inhibits cholesterol synthesis in intact mice.

Professor Lenore M. Kopeloff, in her study of the neuro-biologic effects of an extensive series of metals, plastics and other substances implanted in cerebral sensorimotor cortex of monkeys, has found that a small number of those tested were capable of inducing chronic epilepsy similar to that previously found with alumina cream. Critical evaluation of the lesions induced is under investigation. A tech-

nique has been devised for evaluation of potential anticonvulsants based on capacity to prevent or alter seizures induced by analeptic agents in chronic epileptic monkeys. Dr. Joseph G. Chusid of St. Vincent's Hospital has collaborated in these studies.

Professor Leon Roizin and his collaborators have found in their investigative studies as well as those of others that in Tay-Sachs disease, neurons located outside the cerebrospinal system (submucosal and myenteric plexi, retina) show degenerative changes similar to those of the central nervous system. Professors Roizin and Kaufman and Dr. Richard Ores are collaborating with Professor Roberts Rugh, Associate Professor of Radiology, in a study of the central nervous systems of embryos exposed to intrauterine irradiation with 150 r. at 8.5 and 9.5 g.d.

Professor Frazier, with the assistance of Dr. Ronald R. Fieve, has continued anoxia stress studies on senile persons with a view to developing clinical tests which might predict the response of older persons to future stress, incident to anoxia and arteriosclerosis.

Dr. Gerald Cohen, Associate in Biochemistry, in conjunction with Dr. Paul Hochstein, Associate in Biochemistry, has continued the study of metabolic damage selectively induced in central nervous system tissue by extremely small quantities of hydrogen peroxide, and by H_2O_2 generating agents such as epinephrine, menadione, and certain melanin precursors. It has been established that the major pathway for the detoxification of H_2O_2 in intact cells of many tissues is via the newly discovered enzyme glutathione peroxides, linked to the hexose shunt metabolic pathway for glucose. This work has been related to the problem of drug-induced hemolysis in individuals with deficient levels of the hexose shunt enzyme, G-6-P dehydrogenase; it has been demonstrated that the mechanism of hemolysis involves intermediate generation of H_2O_2 with failure of the glutathione peroxidase system due to the diminished activity of the hexose shunt enzyme.

Dr. Kenneth Sterling has carried out studies in which the existence of a minute amount of "free" or "unbound" thyroxine in human serum was repeatedly verified by dialysis through cellophane. In thyrotoxicosis, it was found that more than twice the normal mean of 0.22% of the thyroxine was unbound (0.47%), and in hypothyroidism slightly more than half the normal (0.14%). The findings are compatible with the concept that physiological activity depends upon the concentration of unbound hormone.

Drs. Esther A. Davidson and Nafi Kiremitci are processing data from a study on the effects of im-

posed sensory deprivation on alcoholic subjects, with three groups, individually matched, of those who have had delirium tremens, those not liable to this complication and non-alcoholic controls. Dr. Kiremitci has continued his study of the effects of different visual environments on otherwise sensorily deprived college students. The reported occurrence of visual images was twice as frequent in the group exposed to homogeneous light as in the group exposed to darkness, but the proportion of highly structured images to geometric and amorphous forms was greater in those without visual stimuli. Of the two situations, homogeneous light was more productive of anxiety and impairment of intellectual function.

At Mt. Sinai Hospital, Drs. Charles Fisher and William C. Dement continue to work on their long range program on the psychophysiology of dreams and sleep; and Drs. Rosenblatt, Chanley, Sobotka and Professor Kaufman are engaged in investigations on the biochemistry of catecholamines in emotional disorders.

Honors and Special Activities

On the twenty-fifth anniversary of the coming of Professor Kallmann to the Psychiatric Institute to found the Department of Medical Genetics, a special symposium on expanding goals of genetics in psychiatry was held at the Institute on October 27-28, which was attended by distinguished geneticists from this country and abroad. Professor Kallmann received an honorary gold medal and scroll from the Eastern Psychiatric Research Association. He was also awarded a gold medal and scroll from the City of Salerno, Italy, for his work during the year.

During the year Professor Kolb was elected President of the New York Society for Clinical Psychiatry, President of the Medical Board of Presbyterian Hospital, and was appointed Chairman of the Special Advisory Committee on Psychiatric Services by the Commissioner of Hospitals of the City of New York. This committee was charged with studying the psychiatric services in the municipal hospitals and bringing forward recommendations directed toward improving patient care.

Dr. Exie E. Welsch served as President of the New York Council of Child Psychiatry; Dr. William A. Schoenfeld as President of the Society for Adolescent Psychiatry, and Professor John P. Lambert as President of the Westchester County Psychiatric Association. Dr. Soll Goodman has continued as Secretary of the American Orthopsychiatric Association.

Professor Carr was appointed Chairman of the

International Committee of the Society for Projective Techniques. Professor Thetford has been appointed research consultant to the Study Program in Human Ecology, Cornell University Medical College. Dr. Warren M. Sperry was presented the 1961 Ames Award by the American Association of Clinical Chemists, for leadership in the movement for recognition of clinical chemistry as a scientific discipline and of clinical chemists as a professional group.

The department is deeply grateful to the organizations and individuals listed below who have so generously supported its work.

The Department of Health, Education and Welfare and the National Institute of Health; The Foundation's Fund for Research in Psychiatry; Society of Human Ecology; DuPont Fund; Barbara Fields Fund; Manhattan Society for Mental Health; Jack and Beatrice Hunter Welfare League; National Science Foundation; American Cancer Society; Atomic Energy Commission; Smith Kline & French Laboratories; Parkinson's Disease Foundation, Inc.; The Adele R. Levy Fund; Milbank Memorial Fund; Dysautonomia Association; Thatcher Brown; Deborah Dietz.



Public Health and Administrative Medicine

RAY E. TRUSSELL

DeLamar Professor and Chairman of the Department

Nineteen sixty-one has been a year in which several major projects have been completed, a new educational venture with the School of Architecture inaugurated, new faculty members added, and the largest entering class in the history of the School admitted in September. Special thanks are always due to the many organizations and individuals in the community who make their time and resources available to students and Faculty alike. Without such help, the School would be incapable of carrying on its various curricula and research activities.

Professor Ray E. Trussell and Dr. Guillermo Ar-

bona, Secretary of Health of Puerto Rico, have been directing a three year study of medical and hospital care in Puerto Rico jointly conducted by a Faculty group from the School and a Puerto Rican research staff. The study was submitted in summary in Spanish to the Governor and Legislature last year. The full report in English has now been completed. Professors Trussell and Frank W. Van Dyke have directed a study of medical and dental care plans in New York State made by a rather large staff group. This report to the Commissioner of Health and the Superintendent of Insurance of the State is a com-

panion volume to an earlier report on Blue Cross.

Professor Trussell serves as a member of the Master Plan Committee and the Board of Directors of the Hospital Council; member of the Board of Directors of the Associated Hospital Service and of the Greater New York Hospital Association. He serves on the Health Services Research Study Section of the Public Health Service. He was also a member of the Joint Committee on Areawide Planning of the American Hospital Association and the United States Public Health Service.

Professor Trussell has been appointed by the Governor to be a member of the State Hospital Review and Planning Council. He is Chairman of the Professional Advisory Committee to the Central Trades Council of the A.F.L.-C.I.O. and, together with Professors Harold Baumgarten, Martin Cherkasky and Mildred A. Morehead, has been advising the Teamsters Joint Council 16 and Management Hospitalization Trust Fund. These latter activities in New York City are particularly significant because of the importance of the decisions made by labor and management in expending the enormous sums of money set aside for health purposes.

A new program for advanced training of architects has been started this year. The students are enrolled in the School of Architecture with which the School of Public Health and Administrative Medicine is cooperating in this joint venture. Seven students are enrolled in the first class.

Since March first, Professor Trussell has been on a combined special and sabbatical leave to serve as Commissioner of Hospitals of New York City.

Division of Biostatistics

Teaching

Except for a fifty percent increase in the number of students, the teaching activities of the division were similar to those of previous years insofar as the public health students were concerned.

The division has been responsible for the instruction of forty-one students with special interest in statistics for one or the other of the academic years covered by the Annual Report for this calendar year. Four of these students have subsequently registered in the Department of Mathematical Statistics of the Graduate Faculties toward a Ph.D. degree in mathematical statistics or biostatistics.

Dr. Khalil M. El-Kashlan resigned as Instructor in Biostatistics during the calendar year; Miss Lillian E. Elveback was added as Adjunct Associate Professor of Biostatistics, and Mrs. Shirley deB. Sternberg was added as Instructor in Biostatistics.

Research

Professor John W. Fertig and Drs. Neal W. Chilton, and El-Kashlan have been continuing the project on statistical methods in dental research on a grant from the National Institutes of Health.

Professors Agnes P. Berger and Ruth Z. Gold have been engaged in extensive consultations over a period of several months with Dr. Shih-Chun Wang, Professor of Pharmacology, on the subject of drug protection against x-irradiation-induced sterility. Professor Berger has been continuing her work on measures of association between binary characteristics.

Mrs. Phyllis B. Michelsen has been collaborating with Dr. Else B. Kris of the New York State Department of Mental Hygiene on a follow-up of patients discharged from mental hospitals. She has also continued her collaboration with Dr. Gilbert Mellin, Assistant Professor of Pediatrics and Assistant Attending Pediatrician, in the study of the development of newborn infants with respect to multiple factors.

Staff Activities

Professor Fertig spent six weeks in Brazil and Argentina as statistical consultant to the World Health Organization. He also serves as a member of the United States Public Health Service committee on public health training.

Professor Berger attended the Seventh Conference on Design of Experiments in Army Research Development and Testing, in Asbury Park, New Jersey, in October.

Professor Gold and Mrs. Sternberg attended the joint meeting of the Institute of Mathematical Statistics, the Biometric Society, and the American Statistical Association, at Cornell University in April.

Division of Community Psychiatry

Teaching

The interdepartmental training programs of psychiatrists in administrative and community psychiatry were carried out again this year within the Division of Community Psychiatry along lines that have been reported on in previous years. Considerable progress was made in stimulating interest and inquiries about these programs among prospective candidates, which resulted in our having a wider choice in the selection of trainees. Fifteen psychiatrists and one special student in public health mental health are currently enrolled in these programs. To date twenty psychiatrists already have completed the various programs.

Changes in the specialized curriculum included a

new course on readings in social psychiatry which was conducted by Dr. Morris Zelditch, Assistant Professor of Sociology at Columbia University.

The supervised community field placement program was carried out again this year in five settings, with the addition of several new placements: New York City Community Mental Health Board; New York State Department of Mental Hygiene, Division of Community Mental Health Services, both in Albany and New York City; Psychiatric Units in General Hospitals — Mount Sinai Hospital, Montefiore Hospital, Jacobi Hospital (Albert Einstein College of Medicine); Psychiatric Hospitals — Dutchess County Psychiatric Unit at the Hudson River State Hospital, Central Islip State Hospital; Residential Treatment Centers for Children — Henry Ittleson Center for Child Research, The Wiltwyck School for Boys and Yale University Law School.

The Division of Community Psychiatry has cooperated with the Department of Psychiatry in the postgraduate courses for psychiatrists from the state hospitals. A course in community psychiatry was conducted this year by one of our trainees, Dr. Archie R. Foley. Dr. Foley also gave a ten week course for ministers in pastoral psychiatry under the supervision of Dr. Lloyd Hamilton, Instructor in Psychiatry and Assistant Attending Psychiatrist in Vanderbilt Clinic.

This year six of the eight community health projects assigned to the regular student body of the School were devoted to problems of the mental illnesses.

Integration with other departments within the Medical Center and affiliated hospitals including state hospitals has been increased by opening certain courses and special lectures to selected staff members and students.

Research

During 1961, the study on psychogenic female infertility in relation to adoption was initiated by Dr. Viola W. Bernard, Clinical Professor of Psychiatry and Associate Attending Psychiatrist, and Dr. Mark Flapan, Research Associate in Psychiatry.

Dr. Bruce P. Dohrenwend, Research Associate in Psychiatry, has continued his studies at the Community Psychiatry Research Unit which were begun under the Columbia-Washington Heights Community Mental Health Project. An appraisal of problems of mental disorder by community leaders was completed. In this research, interviews were conducted with eighty-seven leaders in Washington Heights, the urban area surrounding the Medical Center.

Preliminary work has been done toward a plan of analysis for social and psychiatric data from a survey of a probability sample of 4,500 households. A first statement of a theoretical framework for study of social and psychological sources and consequences of stress has been completed by Dr. Dohrenwend. Further theoretical work and analysis of the literature is in progress. Additional work has been done on a stress situation brought about by the forced relocation of 1,800 families who found themselves in the path of improvements being made in the Washington Heights approach to the George Washington Bridge.

Dr. David S. Sanders, Instructor in Psychiatry, continued to participate in the continuous care of schizophrenic patients project. The details of this project are being reported by Dr. Ernest M. Gruenberg, Professor of Psychiatry (Epidemiology), who is Principal Investigator. One of our trainees, Dr. Alice E. S. Fabian, had a field placement working on this project.

Dr. Robert Silbert, one of our former trainees, has completed his study on some problems of the admission of psychiatric patients to a medical center with complete psychiatric facilities.

Miss Violet Bemmels, Social Worker, has continued working on the Community Agency Survey of the Columbia-Washington Heights Community Mental Health Project. The objectives of this survey are a study of the prevalence of emotional disturbance in the clients of two public and thirteen private agencies functioning in the study zone, and the adequacy with which the known and suspected needs are being recognized and met by the community resources.

Staff

Dr. Howard R. Stanton resigned as Research Associate in the Department of Psychiatry, Division of Community Psychiatry, in July to accept a position with the Social Science Program of the Department of Health, Commonwealth of Puerto Rico. Dr. Mark Flapan replaced Dr. Stanton as Project Director of the research project on psychogenic female infertility in relation to adoption.

Dr. Samuel P. Oast is assisting Dr. Sanders in teaching the mental health courses to the general students in the School of Public Health and Administrative Medicine.

Dr. Sanders participated in an Institute on Interpersonal Relations for Members of the Housing Authority, under the auspices of the New York City Community Mental Health Board. He was a consultant at a Conference on the Epidemiology of

Mental Disorders, Texas Department of Health.

Professor Madeleine Lay Earl was consultant to the Community Agency Survey of the Columbia-Washington Heights Research Project and, in this connection was liaison with the Manhattan Society for Mental Health which contributed to the support of this study. She served as consultant in the social work aspects of Community Psychiatry to the Medical Center as the needs arose.

Epidemiology

Teaching

The three quarterly epidemiology courses required for Master of Public Health candidates remain the same as in previous years. A new elective course on human genetics and epidemiology was given this year. In the first quarter required course, each student submits the details of the natural history of a chosen disease. In the second quarter required course, each student sets up a design for a scientific research project.

The fifth year of the epidemiology traineeship program, financed by the Division of General Medical Sciences of the National Institutes of Health, began on July 1, 1961. There are seven full-time trainees. The trainee program activities include participation in weekly staff conferences and in the teaching program and research. All of the previous trainees are participating in research, some are teaching epidemiology, and one is Chief of the Division of Epidemiology and Diagnosis in a city health department.

In addition to the full-time trainees, there were seven medical student short-term trainees during the summer of 1961 who received instruction in epidemiology and participated in three research projects: family hypertension, coronary artery disease, and weight variation in Washington Heights.

Research

A joint project between the Department of Medicine and the Division of Epidemiology on hypertension among the relatives of hypertensives is being conducted by Dr. George A. Perera, Professor of Medicine, and Professors E. Gurney Clark, Frances R. Gearing, and Morton D. Schweitzer.

A project on deaths from coronary artery disease in areas of New York City is being conducted by Professors Schweitzer and Gearing.

A joint study with the New York City Department of Health is concerned with current status of venereal disease in New York City and is under the direction of Professor Anna C. Gelman, in collabora-

tion with Dr. Jules E. Vandow and Dr. Nathan Sobel of the New York City Department of Health.

Professors Elmer L. Severinghaus, Gearing and Schweitzer have completed a study of weight variation among residents of Washington Heights.

Professor Schweitzer and Dr. Melvin D. Yahr, Associate Professor of Clinical Neurology and Attending Neurologist, are initiating a study of Parkinson's disease with particular reference to family concentration of cases, biochemical studies in patients and controls, and prevalence in defined groups.

Professor Schweitzer and Dr. Mary McLaughlin, Queens Borough Health Officer, New York City Department of Health, and the National Foundation for the Prevention of Blindness, are studying the epidemiology of glaucoma. Purposes are to test efficiency of screening of several defined groups and epidemiologic characteristics to develop hypotheses for testing.

Professor Clark is engaged in a large scale annual study of venereal disease problems in the United States, in collaboration with the American Social Health Association, the American Venereal Disease Association, and the Association of State and Territorial Health Officers.

Staff

Promotion of full-time staff members included Dr. Schweitzer to Associate Professor and Dr. Gearing to Assistant Professor. Because of the increase in the size of the class, additional teaching assistants to serve in the seminars in the first two quarter courses were obtained: Dr. Harold T. Fuerst, Director, Bureau of Preventable Diseases, New York City Department of Health; Dr. Robert H. Thompson, Jr., a Special Dental Research Fellow of the Public Health Service and a lecturer in the School of Dental and Oral Surgery, and Mr. Irving Silverman, a social scientist, who is the director of a mental health research project.

Three part-time staff members who participate in all of our teaching programs have positions which add strength to our teaching program: Professor John P. Fox is Chief of the Division of Epidemiology, Public Health Research Institute of the City of New York; Professor W. D. Mortimer Harris is Chief of the Division of Epidemiology and Diagnosis of the New York City Department of Health; Professor Ralph F. Sikes is Commissioner of Health of Yonkers, New York.

Professor Clark, during his sabbatical leave, visited a number of medical schools and schools of public health to review the teaching of preventive medicine and epidemiology. He is a member of the

World Health Organization Expert Advisory Panel on Venereal Diseases, a member of the committee on International Venereal Disease Problems of the Regional Office of the Americas, and a member of the International Union Against the Venereal Diseases and the Treponematoses. Professor Clark has also been medical consultant to the American Social Health Association, to the Health Information Foundation, and Special Consultant to the venereal disease program of the United States Public Health Service and to the training branch of the Communicable Disease Center of the Public Health Service. He was a delegate of the American College of Preventive Medicine at the National Health Council meeting this year and is the Consultant of the American College of Preventive Medicine with the American Board of Preventive Medicine.

Professor George L. Saiger was acting head of the division during Professor Clark's sabbatical leave. He attended the International Statistical Institute in Paris, and has continued his research in the application of statistical methods of epidemiology.

Professor Schweitzer is a member of the Board of Directors of the American Public Health Association and of the Board of Directors of the Study Group advisory to the National Office of Vital Statistics.

Professor Gelman has cooperated with Dr. Jacques May in the writing of a book, "Studies in Disease Ecology," which was released in late 1961.

Professor Gearing is Executive Secretary of the Epidemiology Planning Committee for Cardiovascular Disease and Director of the Summer Medical Student Training Program of the New York City Department of Health.

Medical Care Administration

Teaching

In the hospital administration course, of which Professor Clement C. Clay is Director, twenty-two students received the Master of Science degree in June, 1961. Six of them accepted administrative positions in the institutions in which they had served as Administrative Residents. Several were inducted into the Armed Forces. Each of the others was appointed to the administrative staff of a hospital. At the end of March, eleven students became Administrative Residents in hospitals while one began the residency in June. Fifteen students entered the program in hospital administration in September as candidates for the Master of Science degree. In addition, a number of other students enrolled in some of

the hospital administration courses. These include seven from the School of Architecture who are specializing in the architecture of hospitals and related health facilities, four physicians from Puerto Rico who will be at the School for only the fall semester, two psychiatrists who are candidates for the Master of Science in Administrative Medicine, another administrative medicine student, and two candidates for the Master of Public Health degree.

A major change is in effect for the administrative residency. Last year, three of the Residents spent the major portion of the year in a hospital, but were assigned for a period of one month to each of several other agencies, such as a Blue Cross Plan, a hospital planning organization, a rural hospital and a group practice prepayment plan. This "diversified residency" proved to be so successful that it was decided to adopt it for the pattern for all of the Residents. Instead of commencing the residency at the end of the second quarter as in previous years, they remained at the School until the end of the third quarter, as it was believed that they would be better prepared to derive the maximum benefit from the residency after an additional quarter of academic work. They were assigned to hospitals within commuting distance of the School so that they could return to the School once a month for a seminar.

Research

Professor Jack Elinson completed the first year as director of the Master Sample Survey in the Washington Heights Health District surrounding the Medical Center, a project made possible by a five-year grant from the Health Research Council of New York City. The first wave of interviewing in a representative sample of households in Washington Heights was supervised by Dr. John L. Colombotos, who has been aided by Miss Regina Loewenstein. Miss Loewenstein, Dr. Colombotos and Professor Elinson reported on some technical aspects of interviewing in an urban area before the Statistical Section at the annual meeting of the American Public Health Association. Miss Loewenstein also presented a paper before the New York Area Chapter of the American Statistical Association on "Problems in Estimating the Prevalence of Mental Illness."

Data from the Master Sample Survey community health and medical care problems are being provided by participating investigators both within and outside the Columbia-Presbyterian setting, including Dr. Lawrence C. Kolb, Professor of Psychiatry and Director of Psychiatric Service, Professor Viola W. Bernard, Dr. Ernest M. Gruenberg, Professor of Psychiatry (Epidemiology), Professor Schweitzer,

Professor Edward A. Suchman, and Dr. Margaret Bailey of the National Council on Alcoholism.

Under the general direction of Professors Elinson and Suchman, Miss Dorothy Arbitman has carried out an exploratory study of the sociopsychological barriers to the use of "chairside" assistants by interviewing 300 dentists in general practice in the Cleveland area.

Professor Elinson collaborated with Professor Suchman in the development of a demonstration program for social science research activities in the Puerto Rican Department of Health. Dr. Howard S. Stanton, formerly associated with Professor Bernard, has become the first director of the program on a grant from the Russell Sage Foundation. Professor Elinson is a consultant to this program.

Ambulatory care services have occupied a large share of the research activities of one research team in the division. It is expected that the information resulting from these studies will be useful to city agencies concerned with medical care activities. Staff members working on the ambulatory care phase of the project constitute a multidisciplinary team representing competencies in public administration, administrative medicine including hospital administration, public health, medicine, nursing, biostatistics, and hospital accounting and business methods. The study team for most of the year consisted of Professors Van Dyke, Virginia M. Brown, and Beatrice Mintz; Dr. Reinaldo Ferrer, Mr. Romuald K. Schicke, Miss Sheila M. Smythe, and Mr. Chang-Jih Yang.

Several plans for future studies have been under discussion and are in various stages of nearing completion. These include the utilization of the Washington Heights Master Sample in the study of patients using organized ambulatory care facilities and the setting up of a model for a well-run and medically effective ambulatory care facility to serve as a standard for evaluating existing facilities. Work on the model facility has involved, in addition to staff discussions, preliminary talks with several hospital directors who are in process of planning extensions of their ambulatory care services and whose efforts might conceivably result in a demonstration project which could be studied by the staff.

The research group also is making a study of long stay patients in hospitals to determine factors leading to overutilization, whether hospital based problems or lack of community resources.

Staff

Professor Clay was on sabbatical leave from February 1 to July 31, 1961. During the spring

term, he was the Visiting Professor of Administrative Medicine in the School of Public Health of the American University of Beirut in Lebanon. There he taught a course in medical care administration and participated in the instruction in courses in hospital administration and public health. He made a study of the program in hospital administration at the American University of Beirut, which included recommendations that it be upgraded to the Master's degree level.

Professor Clay has been reappointed as Chairman of the Board of Examiners' Committee in Region 2 of the American College of Hospital Administrators and has continued to serve as an adviser to the Department of Personnel of the New York City Civil Service Commission in connection with the examination for candidates for the position of Institutional Inspector.

Professor Raymond P. Sloan, together with Professor Baumgarten, directed the hospital administration course during Professor Clay's absence. Professor Sloan continued his many national advisory activities, and served as chairman of the Visiting Committee of the United Hospital Fund.

Professor Elinson has continued to serve on the Epidemiological Studies Committee of the American Heart Association and the Technical Advisory Committee of the New York Heart Association. He was elected to the Board of Directors of the Bergen County (N. J.) Tuberculosis and Health Association. He served on the advisory committees of the Cancer Delay Study at the Albert Einstein School of Medicine, and the Heart Disease Prognosis Study and the Medical Care for Mental Illness Study of the Health Insurance Plan of Greater New York.

Institute of Nutrition Sciences

The faculty was considerably strengthened by the creation of the endowed Robert R. Williams Professorship of Nutrition, to which chair Dr. W. Henry Sebrell, Jr., Professor of Public Health Nutrition, was appointed. Further additions to the faculty include the appointment of Dr. George J. Christakis as Assistant Professor, and Mrs. Mary E. R. Bal, as Instructor.

Teaching

The present student body consists of forty-two students from twenty-two countries and includes fifteen Doctors of Medicine. This strains the old, inadequate and temporary facilities of the Institute to the limit. This large student body reflects the international importance of the work of the Institute in attempting to meet the world-wide need for per-

sonnel trained in public health nutrition.

A new course in nutritional biochemistry was introduced which required the construction of two biochemical laboratories for training and research.

The teaching program includes three months of field work and, in order to obtain suitable additional facilities for research training, as well as for research, a collaborative project was set up with the American University of Beirut, Lebanon.

Research

Other research activities of the Institute have been focussed on studies of lipids and bile acids in relation to atherosclerosis, in collaboration with Dr. Theodore B. Van Itallie, Assistant Clinical Professor of Medicine (St. Luke's Hospital). These studies have shown that a high molecular weight resin, Cholestyramine, will reduce the blood cholesterol level by sequestering bile acids. A new method for the fecal determination of specific bile acids was developed, and studies of bile acid excretion under varying experimental conditions are under way. Another project demonstrated that a mixture of twenty percent peanut oil and eighty percent coconut oil is effective in reducing blood cholesterol levels. A saturated synthetic triglyceride of medium chain length also reduced blood cholesterol levels, thus indicating that the action of lipids in reducing blood cholesterol is not entirely related to the poly unsaturated fatty acids.

Staff

Professor Sebrell served as a member of the Protein Advisory Group of the World Health Organization, Food and Agriculture Organization and United Nations Children's Fund. He is Chairman of the Committee on Protein Malnutrition of the Food and Nutrition Board of the National Research Council, a member of the Technical Advisory Committee of the Institute of Nutrition of Central America and Panama, a member of the Arthritis and Metabolic Disease Program Project Committee of the National Institutes of Health. He is also a member of the Committee on Food Additives of the American Public Health Association, the Panel on Nutrition and Metabolism of the United States Pharmacopeia and on the Advisory Board of the Journal of Lipid Research. He served as Chairman of the Committee of the American Public Health Association which produced the new volume "Control of Malnutrition in Man." Professor Sebrell gave lectures on nutrition at the Conference on Unsolved Problems of Thiamine conducted by the New York Academy of Science and before the American Dairy Association,

the New York County Medical Society, and the Institute of Food Technologists.

Occupational Medicine

Professor Leonard J. Goldwater began a sabbatical leave on September 1, 1961 during which he was Consultant to the World Health Organization in Geneva and conducted a course in industrial health at a World Health Organization Institute held in Alexandria, Egypt.

Research activities continue on absorption and excretion of mercury in man and on cysteine metabolism in relation to occupational poisoning. An international study of the normal content of metals in human biological materials has been started. The project, job performance of the handicapped (cerebrovascular disease), has been completed during the year.

Public Health Education

Professor George Rosen continued to serve as Chairman of the Curriculum Committee. Professor Rosen offered a new elective on studies in the social history of mental illness. This course was given as a seminar and was elected by students in the public health and community psychiatry programs.

Research on the historical sociology of mental illness is now in its third year. The studies on the relation of psychopathology to bizarre individual and group behavior are almost completed, and the book to deal with this material has been started. Some aspects of these studies were presented by Professor Rosen in June, 1961 as the Fielding H. Garrison Lecture at the annual meeting of the American Association for the History of Medicine in Chicago. In connection with this project, Professor Rosen, during July and August, visited a number of libraries, museums, and other institutions to seek materials. A number of communities where there had been outbreaks of so-called mass hysteria of group psychoses were also visited. The countries involved were Italy, Yugoslavia, Austria, and southern Germany.

Professor Rosen has been invited by the administration of the National Institutes of Health to write a history of the Institutes and their activities. This will be a study of the evolving role of the Federal government in relation to research in the health sciences. Professor Rosen concluded his work as director of the American Public Health Association Project on Social Science and Public Health.

Professor Rosen was awarded the William Henry Welch Medal by the American Association for the History of Medicine "for contributions to the social history of medicine during the period 1956-1961, in

continuation of his previous meritorious work in this field."

Public Health Practice

Professor Herman E. Hilleboe, Commissioner of Health, State of New York, was appointed head of division on May 1, 1961. Professor Margaret W. Barnard continued in charge of administrative matters for the division and served as a member of the Curriculum Committee.

Miss Gloria L. A. Dammann, who had been part-time with the division from October 1, 1959 to June 30, 1960, as Assistant Professor of Nursing, Columbia University School of Nursing, was appointed full-time in the division as Assistant Professor of Public Health Nursing on September 1, 1961.

Dr. Eric R. Osterberg, Instructor in Public Health Practice (Continuation Education), was appointed Assistant Professor of Public Health Practice (Continuation Education) on July 1, 1961. In addition to his responsibilities as Program Director, Program of Continuation Education (Public Health), Professor Osterberg served as a member of the Faculty for Public Health Practice.

Professor Barnard continued to be associated with the Columbia Washington Heights Community Mental Health Project. Professors Barnard and Michael Antell continued to be associated with the research study of tuberculosis in the Washington Heights Health District. This study, initiated at the request of the Upper West Manhattan Neighborhood's Association, is being carried out by the Research Bureau of the New York City Department of Health under the supervision of Deputy Commissioner Paul M. Densen, Lecturer, Division of Medical Care Administration, and the immediate direction of Professor Suchman. Begun as a study of a local problem, namely to establish a base line for tuberculosis control activities in an area with a population which is undergoing marked changes in ethnical content, the study has broadened its scope of interest. It has been inter-related with other research being carried out in the Washington Heights Health District and also has proved to be closely related to broader interests of the Research Committee of the New York Tuberculosis and Health Association. Professor Barnard and Dr. Robert C. Darling, Simon Baruch Professor of Physical Medicine and Rehabilitation and Director of Service, are members of this Committee.

Three Schools of the University, Public Health and Administrative Medicine, Social Work, and Medicine, through its Divisions of Community Psychiatry, and of Physical Medicine and Rehabilitation, with a group of citizen leaders have joined in

planning for the development of a unity of community organization and action research in the Washington Heights Health District.

Under Dr. Theodore Rosenthal, Narcotics Coordinator for the City of New York, Assistant Commissioner, New York City Department of Health, and Assistant Clinical Professor of Dermatology, a Narcotics Service Project is being planned for the Washington Heights Health District. Under the joint auspices of the National Institute of Mental Health, the New York City Department of Health and the New York City Community Mental Health Board, the project will provide a demonstration of outpatient management for drug addicts living in the Washington Heights Health District. Professor Barnard and Miss Grace McFadden, Director of Public Health Nursing of the New York City Department of Health, who does part-time teaching in the Division of Public Health Practice, are members of the Planning Committee.

During the past year and a half Professor Barnard has been a consultant in the development of a project for a Health Maintenance Center for 1,000 aged persons in the Queensbridge Houses in the Astoria Health District. The project, a joint venture of the City Departments of Health, Hospitals and Welfare, the Community Mental Health Board, the Housing Authority, two voluntary agencies and citizen leaders, was opened on November 3, 1961.

Professor Dammann is collaborating with Miss McFadden in studies of the coordination of nursing resources available to the project. She also is consultant to Dr. Schweitzer's epidemiologic studies of heart disease.

A community survey of the Danbury (Connecticut) Area Health Council was assisted at its beginning two years ago by a group of students assigned to this as a project under Professor Barnard. The Danbury Area Health Council has now completed the survey. Professor Barnard is continuing as consultant to the Council which is now formulating recommendations for Health Department services in that area.

Professor George James has collaborated with Professor Van Itallie to establish a branch of community medicine in the Department of Medicine. Joint programs in medicine, pediatrics and psychiatry will be conducted by St. Luke's Hospital and the Riverside District Health Center. Studies will be made of means to secure continuity of medical care and to bridge the gap between preventive and curative medicine.

Professor James has also collaborated with Professor Alonzo S. Yerby and Dr. Densen, in studies

on the organization of medical care to secure continuity of preventive, curative and rehabilitation services for Welfare and other medically indigent populations.

Sanitary Science

Professor Alvin R. Jacobson served as a member of the planning committee for the Conference on Teaching of Accident Prevention in the Schools of Public Health held at the University of Michigan, and as chairman of the three day discussion group on training of specialists in accident prevention for operating public health and related accident prevention programs.

Professor Jacobson has been a consultant for three large industrial firms (Grumman Aircraft Engineering Co., General Electric Co., and Boeing Aircraft Co.) on environmental health problems in the Apollo and related spacecraft projects for the National Aeronautical and Space Administration. During the past summer months, Professor Jacobson made a comprehensive study of the New York City water supply for the United States Public Health Service. He also has been requested to write the Bookshelf Article on Environmental Health for the Journal of the American Public Health Association. Professor Jacobson has been made Editorial Consultant to the *Empire State Sanitarian*, publication of the New York State branch of the National Association of Sanitarians.

Mr. Richard W. MacLaughlin, Director of the Division of Sanitary Engineering, Westchester County Department of Health, participates in the discussion of administrative problems of environmental health. Various members of his staff participated in the planning and execution of the two field trips in environmental health each year. Mr. Samuel H. Trichter, Chief Sanitarian, Yonkers Department of Health, has participated in the teaching activities of the division.

Tropical Medicine

Teaching

The division has the responsibility for instruction of both public health students and medical students. Over the years the medical student instruction has expanded from the course in parasitic diseases in the second year to extensive bedside instruction and consultation for the third and fourth year medical students as well as interns, residents and attending staff. Beginning this year the residents in pathology will spend two months in the Division of Tropical Medicine.

Thirteen medical students and two residents par-

ticipated in the medicine in the tropics elective in Panama, Liberia and Surinam. In addition to serving as sub-interns and participating in public health activities, the students carried out research projects, several of which resulted in publications. Dr. Charles Neave, who graduated from the College of Physicians and Surgeons several years ago, is our first trainee in the advanced program in medicine in the Tropics. He is spending a year working towards the Master of Public Health degree with specialization in parasitic diseases and will then spend some time in the tropics.

Professor Harold W. Brown this year assumed the responsibility for the second year medical school course, an introduction to preventive medicine and public health.

Beginning in November the Division of Tropical Medicine assumed complete responsibility for the laboratory diagnosis of tropical diseases for the Medical Center. This new arrangement will lead to better integration of the School's and Hospital's programs in laboratory diagnosis and lead to an expansion and improvement in the service, teaching and research.

The continuing collaboration with Dr. Max M. Sterman, Public Health Physician with the New York City Department of Health Division of Tropical Diseases, and the New York City Department of Health Tropical Disease Diagnostic Center, provided teaching material and clinical experience for medical students, graduate students and residents.

Research

Dr. Mary C. Dunn and Professor Brown completed their study on the effects of the host's endocrine secretion upon helminths. They could demonstrate no relationship between pregnancy of the mouse host and its pinworm burden. They are continuing their studies on the biology of the pinworm and initiating a study on the mechanism of the production of fever in animal hosts by *Trichinella spiralis* infections. Professor Brown with Dr. W. C. Huang, Professor of Parasitology at the National Taiwan University Medical School, evaluated a new anthelmintic, Thiabendazole, against hookworm and *Ascaris* infections in Formosa. This new compound has an exceedingly wide anthelmintic spectrum in animals and man. Studies on the efficacy of this compound against *Strongyloides* of man were carried on in Liberia by our medical students as part of their research experience in Liberia. Professor Brown and Dr. Raul Donckaster, Professor of Parasitology from the University Medical School in Santiago, Chile, are engaged in a study of the feeding habits

and nutrition of *Endamoeba histolytica*, the causative agent of amebic dysentery. Professor Kathleen L. Hussey and Miss Eileen H. Pike are continuing their biological studies of the whipworm and its mode of producing anemia. Professor Hussey has continued her studies on the parasites of larval trematodes which may have significance in the biological control of trematodes infecting man. Professor Roger W. Williams completed his studies on visceral larva migrans in Bermuda. He made a survey of *Culicoides* of St. John, U. S. Virgin Islands, and recommended a control program for their National Park. He is continuing studies on the biting midges of the genus *Culicoides* in Bermuda. Professor Howard B. Shookhoff and Dr. Mahfouz H. Zaki, a graduate student from Egypt, are studying the activity of several antimony compounds against *Schistosoma mansoni* in an attempt to develop a therapeutic regimen which is safe, effective and short. It is estimated that 60,000 Puerto Ricans in New York City harbor this parasite.

Staff

Professor Brown during the summer served for the fifth time as Visiting Professor and Consultant to the National Taiwan University Medical School. A model health center has been developed for community service and education of medical and nursing students and for in-service training of health workers in Taiwan. This Center is now being extensively used by the World Health Organization as a public health demonstration center. Professor Brown has been active in program planning in medical education for Ethiopia and Liberia. He has continued to serve as the President of the New York State Board of Medical Examiners.

Professor Williams, at the request of the New York State Department of Public Health, gave a special course in mosquito identification for sanitarians engaged in disease control. He also collaborated with the National Park Service and Jackson Hole Preserve in developing arthropod control programs. He continued his service as a corporation member of the Bermuda Biological Station for Research.

Continuation Education

The year 1961 represented a year of rapid expansion of the activities of the hospital administration portion of the program of continuation education. During this time, in addition to the basic hospital administration course, the course for physicians in industry, and the course for directors of volunteer services, all of which have been given in the past,

two pilot programs for nursing home administrators were started. An International Section was established for the purpose of presenting a course in 1962 for administrators of hospitals in under-developed nations.

Several special projects also were carried out by the program staff. For example, an eight-month intensive course in the financing and distribution of medical and hospital care for union and management trustees for the Welfare Funds sponsoring the Teamsters Joint Council Number Sixteen and Management Hospitalization Trust Fund was completed in June of 1961.

At the present time, program staff members are serving as staff to one of three sub-committees of the Professional Advisory Committee for the Central Trades Council of New York.

Thirty-four administrators of smaller hospitals completed the year-long basic hospital administration course which began in June, 1960. The fifth class, with an enrollment of twenty participants, began work on the course in June, 1961. The persons who have completed the program have achieved recognition for their work in hospital administration. Seventeen are officers of state or national hospital associations, and approximately thirty-five have been admitted to the American College for Hospital Administrators.

The Fourth Annual Institute for Physicians in Industry was held in February, 1961. Eighteen physicians registered for the Institute and participated in the four courses. In conjunction with this Institute, the program of continuation education has taken over the distribution of home-study courses in biostatistics and industrial toxicology. Also new home-study courses for physicians in industry have been prepared on radiation hazards in industry and on industrial hygiene.

Two nine-month programs for administrators of nursing homes were inaugurated in the Fall.

Mr. Alfred F. Popoli has joined the continuation education staff. Mr. Popoli is assuming major responsibility for the nursing home administration course, and is assisting in the planning for the international section of the program.

Professor Baumgarten, Program Director of the hospital administration portion of continuation education, continued to serve as a regular member of the Faculty in the School's Division of Medical Care Administration. In addition, he established two special programs for physicians who will hold various administrative posts in Puerto Rico.

During the year Professor Baumgarten served for two months as Visiting Professor of Hospital Ad-

ministration at the University of Sao Paulo, Brazil, and at the National University of Mexico, Mexico, D. F. He was a guest lecturer at the University of Minnesota, and the George Washington University. He served as a member of the Hospital Advisory Committee of the W. K. Kellogg Foundation, the Education Committee of the American Hospital Association, and the Advisory Committee for the Tufts University research project on non-academic education in hospital administration.

The primary objective and function of the public health section of the program of continuation education is to provide, through the medium of short intensive courses, current and pertinent information and knowledge in the broad field of public health to personnel of the official and voluntary health agencies. While the majority of those attending the institutes are from agencies in New York State, personnel from adjacent areas are invited and do participate.

Professor Eric R. Osterberg, who is Program Director for the public health portion of continuation education, was designated as Consultant to the Office of Professional Education of the New York State Department of Health, and in this capacity assisted in organizing the educational experiences of foreign public health visitors to the State Health Department. Professor Osterberg participates in the teaching program of the Division of Public Health Practice as his time permits. Effective with the appointment of Professor Hilleboe as Head of the Division of Public Health Practice, the public health section of the program of continuation education was made responsible to him for supervision.

Donors

The School program is enriched through gifts and grants from governmental agencies and private organizations. In 1961 these included: The Aluminum Company of America; American Quicksilver Institute; Associated YM-YWHA of Greater New York; Association for the Aid of Crippled Children; Borden Company; Burroughs Wellcome and Company; Campbell Soup Company; Corn Products Company; United States Department of Health, Education, and Welfare; Field Foundation; Firestone Plantations Company; Foundation on Employee Health, Medical Care and Welfare; General Foods; General Mills Company; Government of Puerto Rico; Grant Foundation; H. J. Heinz Company; Health Research, Incorporated; Health Research Council of the City of New York; Imperial Color Chemical Company; W. K. Kellogg Foundation; Lakeside Laboratories; Liberian Mining Company; Josiah Macy, Jr., Foundation; Merck and Company; Metalsalts Corporation; Metropolitan Community Foundation; Milbank Memorial Fund; New York Heart Association; New York State Department of Mental Hygiene; Nutrition Foundation; Pillsbury Company; Rockefeller Foundation; Teamsters Joint Council #16 and Management Hospitalization Trust Fund; Union Family Medical Fund; United Hospital Fund; Wesson Fund for Medical Research and Education; Whitehall Foundation.

The School is grateful to the anonymous donor of the School of Public Health and Administrative Medicine-Columbia Presbyterian Medical Center Hospital Administration Gift for financial aid to students in the hospital administration program.

Radiology

WILLIAM B. SEAMAN

Professor and

Chairman of the Department

Director of Service



The trend of modern radiological practice is towards increasing specialization. The sub-specialties of radiotherapy, neuroradiology, pediatric radiology, and cardiovascular radiology are now being recognized and similar developments are already occurring in the fields of radiologic urology, gastroenterology, orthopedics, and chest diseases. This is necessitated not only by the rapidity with which medical knowledge has been increasing but also by the development of new and complicated diagnostic techniques and equipment. The professional activities of this department have been subdivided along these lines for many years. A training program in neuroradiology has already proven quite successful and attempts are under way to establish similar training programs in these other fields.

Staff Changes

Professor Norah duV. Tapley has been on leave of absence during the past year in order to do radiobiological research at Stanford University. She has extended her leave of absence for one more year in order to work at the National Institutes of Health,

Bethesda, Maryland. Dr. Donald W. Johnson, Dr. Robert Silbey, Dr. Willard F. Machle, and Dr. Walter G. Heimann resigned to enter the private practice of radiology. Partial replenishment of the staff was accomplished by the arrival of Dr. Harold Goldman, Dr. Samuel J. Phillips, and Dr. Ray Brinker as Assistant Radiologists. Professor Elmer E. Stickley, formerly of the Medical Division of the Brookhaven National Laboratory, has been appointed Associate Professor of Radiology (Physics) and will assume general direction of clinical radiation physics.

Dr. Norman E. Chase resigned to accept a position as Assistant Professor of Radiology at New York University. Dr. Norman Leeds completed his training fellowship in neuroradiology and accepted a position as Assistant Professor of Radiology at the University of Southern California.

Teaching and Patient Service Activities

With the cooperation of the Department of Medicine, the radiology department has been conducting teaching sessions with the fourth year students assigned to the Group Medical Clinic. These sessions

consist of discussing the clinical radiological problems of the patients they have seen in the clinic. This type of teaching activity has the advantage of dealing with actual rather than theoretical problems and has been most enthusiastically received by the students.

The third presentation by Professor Juan M. Taveras and colleagues of the postgraduate course in neuroradiology was oversubscribed by more than one hundred registrations. A postgraduate course on the radiology of bones and joints was presented by Professor Meyer Alpert to twenty-five radiologists and orthopedists.

The course leading to a masters degree in radiologic physics has a full enrollment. Professor William Gross has assumed primary responsibility for the organization of the curriculum.

The course in radioactive isotopes under the joint leadership of Professors Edith H. Quimby and Sergei Feitelberg and with the cooperation of guest lecturers, continues to be offered twice yearly. In 1961 there were fifty-one registrations by radiology residents from hospitals throughout the city for Professor Quimby's course in radiologic physics.

At the present rate more patients have been examined in Harkness X-ray than in any previous year with an increase of 1,300 over 1960, and 2,200 over 1959. This has been done with no increase in staff; in fact there has been one less radiologist than in previous years.

The endorsement by the Medical Board of the principle that certain special procedures such as cerebral arteriography, aortography, peripheral arteriography, pneumocephalography, and other special procedures may be done by the radiologist as well as other suitably qualified physicians on the medical staff, has been received with great satisfaction. For improvement of patient care, development of improved diagnostic techniques, and the future of radiology as a specialty, it is important for radiologists to have this privilege. This has already resulted in improved efficiency in the Neurological Institute with reduction of waiting periods for certain procedures. It has also resulted in the institution of a promising new technique, retrograde percutaneous femoral angiography for the investigation of a wide variety of intra-abdominal and intrathoracic diseases.

New Equipment

Two major projects consisting of remodelling and installation of new equipment were completed during the year. On the third floor of Presbyterian Hospital consolidation of some of the service activities, relocation of a previous existing radiographic room,

and remodelling of a work room has provided space for an additional radiographic-fluoroscopic room. The new radiographic room consists of remote control television-cine equipment. The substitution of a television monitor for a fluoroscopic screen permits the radiologist to sit in an adjacent control room and thus avoid radiation hazards. The use of image intensification and cine-radiography permits photographic recording of motion and greater accuracy in the detection of abnormalities, at lessened radiation for the patient. This is the second installation of its kind on the North American Continent and probably represents a forerunner of future radiographic techniques.

The radiological division of the Neurological Institute opened its doors on December first. The new department provides approximately twice the previously available floor space and contains six diagnostic rooms, plus a 2,000 curie Cobalt radiotherapy installation. The two fluoroscopic myelographic rooms are equipped with image intensification to permit more efficient operation and lessened radiation to the patient. The new diagnostic machines include equipment for biplane cerebral arteriography capable of changing 11 X 14 films at rates up to six per second, automatic film developing machine, erect and vertical laminographic equipment. Adequate space is provided for film reviewing and dictating, film filing, and offices which should greatly enhance the effectiveness of this unit.

Because of the increased demand for arteriographic procedures in Presbyterian Hospital, a new Schonander film changer has been installed for abdominal arteriography, and a film changer using long cassettes for vascular roentgenography of the extremities. A television monitor was installed in the cardiovascular diagnostic laboratory which displays the fluoroscopic image so that it may be observed by the entire cardiac catheterization team.

Research Activities

Division of Radiotherapy

The members of the radiotherapy staff and Dr. Cyril Sanger, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist, are continuing their clinical study of the effects of high pressure oxygen and radiotherapy on malignant tumors. A preliminary series was completed last year and a larger series containing randomly selected controls is now under way.

Professor Harold W. Jacox is continuing studies of the effect of betatron radiation on cancer of the urinary bladder, nasopharyngeal tumors, and on normal tissues.

Dr. Harold L. Atkins, Dr. William D. Horrigan, and Professor Tapley analyzed a large series of cancer patients treated palliatively with unconventional fractionation using massive doses. This study is now being continued and has been found useful in reducing morbidity and duration of hospitalization. Clinical appraisal of cyclophosphamide in the treatment of far advanced cancer has been carried out by Dr. Atkins, Dr. H. G. Gregg, and Dr. George A. Hyman, Associate in Medicine and Assistant Physician. This drug has proved to be of value in carcinoma of the ovary, endometrial cancer, and reticulum cell sarcoma. The study of combination chemotherapy and radiation in the treatment of retinoblastoma has been carried on by Dr. Patricia Tretter in the absence of Professor Tapley. She is working with Dr. Hyman, Dr. Robert Ellsworth, Instructor in Ophthalmology and Assistant Ophthalmologist, and Dr. Algernon Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist. Dr. Atkins is collaborating with Dr. David V. Habif, Associate Professor of Clinical Surgery and Associate Attending Surgeon, and Dr. Sven Kister, Assistant Resident in Surgery, in the study of lymphatic function of the upper extremity after radical mastectomy by means of radioactive iodinated human serum albumin.

Dr. James W. Correll, Assistant Professor of Clinical Neurological Surgery and Assistant Attending Neurological Surgeon, Dr. Chase, and Dr. Atkins have reported a new technique of interstitial irradiation of brain tumors utilizing a special preparation of Iridium-192 seeds in nylon tubing. This material has also proved useful in the treatment of primary and metastatic malignancies of the head and neck.

Dr. Melvin Becker and Professor Jacox have completed a study of the staging of nasopharyngeal tumors in cooperation with the National Cancer Institute of the National Institutes of Health. Our experience with radiotherapy of carcinoma of the nasopharynx is being reviewed and analyzed by Dr. George Drake, Dr. Becker, and Dr. Raffaele Lattes, Professor of Surgical Pathology and Attending Surgical Pathologist.

Dr. Becker with Dr. Henry Clay Frick, 2nd, Assistant Professor of Clinical Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, and Dr. Harold M. M. Tovell, Assistant Clinical Professor of Obstetrics and Gynecology and Assistant Attending Obstetrician and Gynecologist, are continuing their clinical analysis of cancer of the vulva. Dr. Becker and Dr. Saul B. Gusberg, Associate Professor of Clinical Obstetrics and Gynecology and Associate Attending Obste-

trician and Gynecologist, are developing a new applicator for use in the treatment of carcinoma of the cervix. Dr. Becker, Dr. Nicholas P. Christy, Assistant Professor of Medicine and Assistant Attending Physician, and Dr. Donald A. Holub, Instructor of Medicine and Assistant Physician, are conducting a clinical analysis of patients with acromegaly and Cushing's disease who have had radiation to the pituitary gland. Dr. Becker and Dr. Hyman are reviewing the management of patients with mediastinal Hodgkin's disease complicating pregnancy.

Cardiovascular Diagnostic Laboratory

The combined angiocardigraphic cardiac catheterization suite is being presented with an ever increasing patient load, especially by patients in the neonatal period. Professor A. Gregory Jameson has been investigating the use of hydrogen gas for the detection of intercardiac shunts and has also been conducting statistical analysis of blood oxygen determinations in order to improve the sensitivity of this method for shunt detection.

Radioactive Isotopes

The radioisotope laboratory under the direction of Professor Quimby continues to receive and standardize all the radioactive isotopes and dispense them to clinical and research departments. During the past year eighty-nine shipments, comprising over 5,000 millicuries were received. The broad license for radioactive isotopes continues to be administered by the Joint Radioactive Isotopes Committee of which Professor Harald H. Rossi is the Chairman, and Professors Jacox, Quimby, and William B. Seaman are members. About 385 applications were reviewed during the past year.

Professor Quimby has been studying the *in vitro* resin uptake test, using tri-iodothyronine as a measure of thyroid activity. This test has now been performed on the sera from 310 patients.

The utilization of radioactive isotopes has increased sharply. Techniques for hepatic scanning and radioactive renograms have been developed by Dr. Atkins and have now been added to the list of routinely available diagnostic procedures. Scintiscanning of the liver with radioactive gold 198 has become a popular procedure and is being used in the study of hepatic metastases and cirrhosis. Other organs being examined by scanning techniques are the brain and kidney using radioactive mercury tagged neohydroin, the spleen with chromium 51 tagged red cells and the thyroid. Evaluation of comparative bilateral renal function with I^{131} tagged hip-

puran has proved of value in the investigation of patients with hypertension. Dr. Atkins is in the process of evaluating this procedure as a means of detecting early recurrence of pelvic malignancies producing ureteral obstruction. The recent availability of I^{125} has prompted Drs. Atkins and Meyers, and Mr. Daniel Alessandro to study its applicability in a variety of clinical tests.

Division of Diagnostic Radiology

The installation of the remote control television cine equipment has instigated a study to evaluate the accuracy of this method in the detection of gastrointestinal abnormalities as compared to conventional roentgenographic techniques. This study is being conducted by Professors Seaman and Ralph Schlaeger and Dr. Edward D. Fram. Studies of the normal and abnormal larynx by use of contrast laryngography is being continued by Professor Seaman, Dr. Kanter, Dr. P. Carbajal, and Dr. Daniel Baker, Clinical Professor of Otolaryngology and Attending Otolaryngologist. An exhibit of this work was displayed at the meeting of the American Roentgen Ray Society in Miami, Florida, and at the Academy of Otolaryngology, Chicago, Illinois. Professor Kent Ellis with Dr. Beverly C. Morgan, Dr. Sidney Blumenthal, Professor of Clinical Pediatrics and Attending Pediatrician, and Dr. Dorothy H. Andersen, Professor of Pathology (Pediatrics) and Assistant Attending Pediatrician and Attending Pathologist, have completed a study of congenitally corrected transposition of the great vessels. Professors Ellis and Jameson have also completed an analysis of the unusual cardiac anomaly of levoposition of the right atrial appendage. Professor Ellis and Dr. A. Gerald Renthal are analyzing the roentgenographic features of pulmonary sarcoidosis. Professor Ellis is also engaged in extensive studies of cardiac abnormalities including dextrocardia, and other rare congenital anomalies, including transposition of the great vessels, anomalous origin of the left coronary artery, and anomalies of the left heart. Professor Ellis, Dr. Kanter, and Dr. Shivaji B. Bhonslay, Instructor in Surgery and Assistant Attending Surgeon, have developed a technique for percutaneous retrograde femoral arterial catheterization which has proven to be useful in the study of vascular diseases affecting the kidneys. Professor Ellis and Dr. George Stassa are working on a percutaneous technique for the visualization of the pelvic veins and the inferior vena cava. It is felt that this would be of value for demonstrating the existence and extent of pelvic and retroperitoneal neoplasms. Professor Ellis and Dr. John B. Price, Jr., Instructor in Surgery and Assist-

ant Surgeon, are working on a technique for splenoportography.

Professor Josephine Wells with Dr. Charles A. Flood, Associate Professor of Clinical Medicine and Associate Attending Physician, and Dr. Harold Harvey, Professor Emeritus of Surgery and Consultant in Surgery, have completed a study of carcinoma of the stomach. Professor Wells has completed a review of the roentgenographic aspects of patients with rheumatoid arthritis before and following treatment.

Professor David Baker and Dr. John Apperson, Assistant Resident in the Department of Urology, are developing a technique of cystography with simultaneous pressure and volume recordings to evaluate cysto ureteral reflux and to assess the efficacy of treatment in patients known to have reflux. Professor Baker and Dr. Thomas V. Santulli, Associate Professor of Clinical Surgery and Attending Surgeon, are reviewing the cases of patients with imperforate anuses in an attempt to correlate the presence and degree of sacral deformity with the degree of difficulty in establishing fecal and urinary continence post-operatively. Professor Baker with Dr. Sylvan Sarasohn is reviewing all cases of Legg-Perthes disease in attempt to correlate prognosis with radiographic appearances.

Professor Alpert and Dr. Arthur B. Voorhees, Jr., Instructor in Surgery and Assistant Attending Surgeon, are continuing to study and to develop the techniques of arteriography in patients with bone and soft tissue tumors. Professor Alpert with Professors Seaman and Habif are developing a method of breast roentgenography for the detection of carcinoma. Professor Alpert with Dr. Morton A. Meyers is reviewing our experience with carcinoma of the parathyroid glands.

Professor Ralph Schlaeger with Dr. Gregg is evaluating the roentgenographic criteria for the diagnosis of malignancy in smooth muscle tumors of the stomach. Professor Schlaeger with Dr. George Stassa is comparing the pre- and postoperative status of the distal esophagus in patients with hiatal hernias.

Professor Gerhart S. Schwarz with Professor Roberts Rugh, and Dr. William F. Caveness, Assistant Professor of Clinical Neurology and Associate Attending Neurologist, continue their studies on the electroencephalographic changes in rats produced by radiation. Professor Schwarz is also continuing his work on the perfection of the XVS system of unit exposures for radiography.

The study to develop and improve methods of localizing brain tumors with radioactive isotopes is being continued by Professor Taveras and Dr. Ed-

ward B. Schlesinger, Assistant Professor of Clinical Neurological Surgery and Attending Neurological Surgeon. Professor Taveras with Dr. Bennett Stein, Assistant in Neurological Surgery, have been doing post-mortem angiography of the sub clavian, carotid and vertebral arteries to determine the incidence of vascular stenosis and occlusion. A tumor registry of all neoplasms seen at the Neurological Institute is being developed.

Staff Activities

Professor Seaman was elected President of the New York Roentgen Society and Chairman, Radiological Section, New York State Medical Society.

The International Congress of Neuroradiology in Rome, Italy was attended by Professor Taveras, and Drs. Leeds and Chase. Professor Taveras was elected President of the 1964 International Congress which is to be held in New York City in 1964. He continues his activities as member of the Post Graduate Training Committee (Section of Neurology) of the National Institute for Neurological Diseases and Blindness. Professor Taveras was appointed consulting professor to the Neurology Post Graduate Training Program of the University of Puerto Rico and presented a course on cerebral angiography for members of the Radiological Society of Puerto Rico. He presented papers at the Sixth Neurological Symposium in Rome, The International Congress of Neurological Surgeons, and the Third Central American Congress of Radiology in Costa Rica.

Professor Jacox continued as Editor of the Radiotherapy Section of the Year Book of Radiology, and as representative of the Radiological Society of North America to the American Standards Association. Professor Schwarz continues his duties as Editor of the Medical Circle Bulletin. He was recently appointed representative of the American Roentgen Ray Society to the American Standards Association. Dr. Becker and Mr. Theodore Villafanna of the Physics Section constructed a pelvic phantom for dosimetry purposes which was exhibited at the meeting of the Radiological Society of North America.

The national and international scientific activities of Professor Rossi include the following: Member, Advisory Committee on Ionizing Radiation for the Mayor of the City of New York; Member, Isotope Committee, St. Luke's Hospital; Member, Physics Committee of the Radiological Society of North America; Member, National Committee on Radiation Protection. Professor Rossi is a member of the Main Commission of the International Commission

on Radiological Units. Professor Rossi is also a Member of a Joint Committee on RBE of the International Commission on Radiological Units and the International Commission on Radiological Protection. Professor Rossi presented a paper at the International Biophysics Congress in Stockholm, Sweden in August 1961, and also a paper at the Health Physics Society meeting in Las Vegas, Nevada, in June 1961. Both Professors Rossi and Quimby presented invited papers at the Special Session honoring Professor Emeritus Giacchino Failla at the meeting of the Radiological Society of North America.

Professor Quimby, with Dr. Otto Glasser and Dr. Russell Morgan has completed a revision of "Physical Foundations of Radiology." This third edition of a widely-used text will appear late in 1961.

Professor Quimby is a member of the Advisory Committee on Isotope Distribution of the Atomic Energy Commission, the National Committee on Radiation Protection, the Committee on Handling and Disposal of Radioactive Isotopes of the International Commission on Radiological Protection, and of the Commission on Radiological Units, Standards and Protection of the American College of Radiology. She is an examiner for the American Board of Radiology, and on the editorial advisory board of "Radiology." She is also a member of Subcommittee M-1 (of the National Committee on Radiation Protection).

Professor Quimby received the Gold Medal of the Interamerican College of Radiology presented in absentia at the meeting of the Interamerican Congress of Radiology in Sao Paulo, Brazil. This was received for Professor Quimby by Professor Emeritus Ross Golden.

Professor Gross has continued his membership on Subcommittee M-1 of the National Committee on Radiation Protection and a Consultantship on Subcommittee M-3 of the National Committee on Radiation Protection. He is also a member of Task Group (3) on "Measure of Stopping Power Ratios and Analysis of Present Data."

During 1961, Professor Rugh gave an invited lecture at the IV International Congress of Neuro-pathology in Munich, Germany, and the VI Symposium on Radiobiology in Rome, Italy. Professor Rugh is a member of Subcommittee M-1 of the National Committee on Radiation Protection.

Francis Delafield Hospital

Division of Radiotherapy

A large percentage of the patients in this department are treated either on a two-million volt x-ray

machine or a Cobalt 60 unit. The results of this type of therapy have been evaluated in various diseases. The first evaluation of a patient group with the diagnosis of clinically operable carcinoma of the breast classified as inoperable by virtue of proven metastases to the highest axillary or internal mammary nodes, who were treated exclusively with two million volt therapy has been completed. The response of the primary tumor and the lymph nodes to radiation has been of special interest as well as the survival rate in this group.

The diagnostic usefulness of the selective uptake of radioactive ferrous citrate by malignant tissues, which may make early detection of cancer possible is now under study. A technique of bronchial washings by using specially designed tubes permitting collection of specimens from various lobes of the lung has proven promising for the detection of tumor cells in patients in whom other diagnostic techniques have failed. Grateful acknowledgment is made of the donations of Mrs. Jane Scheerer of Llewellyn Park, West Orange, New Jersey.

Radiodiagnosis

Special studies for the visualization of small tumors in the anterior mediastinum are being continued by Professor Arnold L. Bachman in collaboration with Dr. Wolfgang Ackermann, Associate Visiting Surgeon at the Francis Delafield Hospital, and Dr. Kevin L. Macken.

Further investigation with azygography and internal mammary vein visualization continues. The work on tumor angiography is being broadened to include other types of tumors and regions.

Clinical investigations of the larynx and hypopharynx continue, and additional data of the various types of abnormalities are being compiled.

Trephine biopsies of bone are being continued by Dr. Ackermann. A correlation study of the radiographic appearance and biopsy report is being undertaken. The results will be prepared for publication if considered of sufficient interest. At present, there are over 500 such cases available for study.

The Department of Radiology has received a grant from the United States Public Health Service for the past year amounting to \$17,480. This sum includes the costs of major capital purchases (image intensifier), for personnel salaries and operating and incidental expenses.

Radiologic Physics

Mr. Carl B. Braestrup has been continuing to study physical dosage factors in teletherapy. The purpose of this investigation is to establish stand-

ards for the determination of gamma beam depth dose distribution and to provide authoritative isodose charts for clinically useful techniques employed with various types of cobalt gamma beam equipment. The work completed during the past year includes the following: (a) design and construction of the necessary phantom and remote controlled positioning equipment, also special small-diameter ionization chambers for the determination of the depth dose, (b) the evaluation of the penumbral region with film and ionization chamber measurements for different diameter cobalt sources, (c) field studies of the dose distribution obtained with different types of cobalt equipment. Isodose charts are now being prepared on the basis of our findings.

The investigation utilizing I-131 and Hg 203 for the determination of the cerebral circulation time has been completed. The equipment used for this purpose consists of two scintillation probes feeding into a dual channel tape recorder. The stored data is extracted by a dual channel meter coupled to a recording oscillograph. The cerebral circulation time is determined by measuring the time between the venous and arterial flow peaks.

The project "Physical Dosage Factors in Teletherapy" was aided by an Atomic Energy Commission grant until October 1, 1961; after that date the United States Department of Health, Education and Welfare gave it financial support.

Radiobiology

Dr. Anna Goldfeder has continued to direct her research activities towards detecting factors influencing cellular radiosensitivity.

In a repeated series of experiments with x-ray doses ranging from 5,000 to 12,000 r applied in single exposures, it was found that a dose of 8,000 to 10,000 r was required to achieve total regression of the epithelial type tumors ranging from 12 to 16 mm in diameter, while for the spindle cell type tumor of about the same size, doses ranging from 10,000 to 12,000 were necessary to achieve complete regression.

In a subsequent series of experiments using smaller tumors (about 1.0 cm. in diameter) of both types, complete regressions of the tumors were achieved with relatively smaller doses (4,000 to 6,000 r). From the experience gained at autopsies of treated animals, it may be concluded that not only the size of the tumor but its invasion into the surrounding normal tissues play a significant role where total regressions of tumor following x-ray treatments are concerned.

In studies planned to evaluate the influence of the

time factor, observations obtained so far indicate that a greater effect on tumor repression was obtained at low dose rates (about 8 equal exposures at 24 hour intervals).

A significant difference in the metabolic pathways was found between the epithelial and spindle cell type tumors. The intracellular composition as revealed by electron microscopy explains to some extent the difference in the metabolic behavior between the spindle and epithelial tumors.

Radiological Research Laboratory

The research project for the Atomic Energy Commission operates under a contract between Columbia University and the Atomic Energy Commission, and is under the direction of Professor Rossi. Research is conducted in three general fields: radiologic physics, radiation biophysics and radiobiology. A summary of the activities in various areas is given below.

Radiologic Physics

Research in radiologic physics is carried out in a joint effort by Professor Rossi, Professor William Gross, and Dr. Marion Biavati, Dr. Catherine Wingate, and Mr. Leon Goodman, and associates.

An experiment concerning the relative biological effectiveness (RBE) of fast and slow neutrons, undertaken in collaboration with members of the Medical Department of Brookhaven National Laboratory was continued. The measurements of the first collision dose and of the absorbed dose distribution in the mice have been extended to cover the neutron energy range from 760 Kev down to 100 Kev. This experiment utilized for the first time a new electronic instrument developed by this laboratory for the automatic compensation of ionization chambers by the Townsend method.

In addition, a tissue equivalent proportional counter with a 10 mil plastic wall surrounded by an aluminum shell 30 mils thick, has been constructed for the measurement of dose as distributed in Y for neutrons in the energy region noted above.

Work is also progressing on the development of an ionization chamber system which will be capable of directly measuring the RBE dose (in REM units) in a mixed radiation field with an accuracy of at least plus or minus 10%. The two chambers comprising this system will be tested in the near future with neutrons from the target of a Van de Graaff accelerator.

The attempt to find a suitable physical parameter to correlate with the RBE of various radiations has been extended from measurements of LET (linear

energy transfer) and Y to the investigation of a new quantity denoted by Z. It is termed the local energy density and is the energy absorbed by a small sphere of tissue (a few microns or less in diameter) divided by its mass. This quantity Z may vary greatly from the absorbed dose (D) of an irradiated material, due to statistical fluctuations in both the number of events in the sphere and in the energy deposited per event. For a given absorbed dose, $P(Z)$, the probability distribution of Z in small masses differs considerably for different radiations.

$P(Z)$ is measured in a spherical tissue equivalent proportional counter filled with tissue equivalent gas. Tissue spheres of various sizes were simulated by varying the gas pressure. The event spectrum corresponding to the absorption of biologically significant doses is duplicated in the counter in very short time intervals.

For these measurements an instrument has been developed to sum electrically the heights of all pulses which arrive within a present time.

The probability spectra of Z have been measured for Pu-Be neutrons, Co^{60} gamma rays and Tm^{170} x-rays at sphere sizes of 7 μ and 1 μ diameter for doses ranging from a few tenths of a rad to several thousand rads. An attempt is underway to correlate these results with available biological data.

In order to represent very small-sized spheres (less than 0.1 micron) the pressure in the proportional counter must be reduced to a point where the counter will no longer function properly. In addition, for particles of low LET only a few ion pairs are produced by the ionizing particle and the results become difficult to interpret because of the avalanche statistics. A new method is therefore being developed for measurement in very small spheres.

Measurements of absorbed tissue dose about an interface between soft tissue and another material have been completed. Preliminary dose distribution curves as a function of distance from the interface were reported previously for regions bordering a soft tissue-bone interface and a soft tissue-glass interface for various x-ray energies below 210 Kv. Following experimental measurements of some pertinent physical quantities and corrections, rad/r values have been assigned to these experimental results with considerable accuracy (3 to 6% maximum error). Only calculated dose rates with uncertain accuracy were previously available for interface situations. The experimental results are applicable to soft tissue structures of less than 30 microns diameter adjacent to bone, such as osteocytes, marrow cells, Haversian canals, or possibly tumor cells.

Final values for the amount of energy expended by an electron in producing an ion pair in tissue equivalent gases have been obtained. Relative to air these are 0.998 for muscle equivalent gas and 0.889 for bone equivalent gas.

In collaboration with the biophysics section a study is in progress to determine the relation between dose, RBE in tissue culture cells, and Z (energy absorbed per unit mass by small tissue spheres), using radiations of widely differing specific ionization such as 180 kvp x-rays, 0.66 mev gamma-rays from Cs-137, and alpha-particles of 8.8 mev from Th C'. For the alphas irradiation a 5 mc radio-thorium source has been obtained and a special housing has been built which will allow preparation of daughter sources in convenient form. Equipment for dose measurements and for the irradiation of tissue cultures is being designed and built.

Radiation Biophysics

Research in radiation biophysics is carried out jointly by Professor Rossi, Professor Ruth F. Hill, Dr. Edgar Watts and Mr. William Kunz.

The functional impairment of somatic cells by spontaneous mutation has been postulated as a possible mechanism of the normal aging process. This hypothesis predicts that the spontaneous somatic cell mutation rate is inversely proportional to the life span of a species. An experiment has been undertaken to test this hypothesis. It involves the measurement of the spontaneous sex-linked lethal mutation rate and the rate of aging, at 17° C. and 27° C. in a Formosa strain of *Drosophila melanogaster*. The sex-linked lethal mutation frequency was found to increase with the age of the experimental male at both temperatures. The ratios of the mutation rates and rates of aging at 27° C. and 17° C. were 28 and 24 respectively. The ratio of the median lifespans at 17° C. and 27° C. was 2.2. Thus there would appear to be some basis in fact for considering somatic mutation as a cause of senescence. A detailed statistical analysis of the experimental data is now in progress. The study is being performed with the kind cooperation of Dr. Theodosius Dobzhansky, Da Costa Professor of Zoology of Columbia University.

Research in radiation microbiology has been concerned with two main problems. The first is the production of mutations in bacteria by radiation and the particular system under investigation at present is mutation from amino-acid requirement to independence. A study of the dose-mutation relationship indicates a saturation of the mutagenic effect at low doses of radiation. Evidence also suggests

that potential mutants may have a different response to post-irradiation treatments than cells which are not destined to become mutants. Attention has also been focused on the characteristics of the radiation-produced reversions. More than 90% can be described as partial prototrophs and at least 30-40% eventually return to amino-acid dependence.

The second problem is the mechanism governing differences in radiation sensitivity between mutants of a single strain of bacteria. We have on hand both radiation-sensitive and radiation-resistant mutants of *E. Coli* strain B. Additional genetic markers are being introduced into these mutants in order to see whether direct genetic recombination by a form of sexual union or by the use of phage vectors will also cause the transfer of the radiation sensitivity characters.

The Cell Culture Section continues its work with the Puck quantitative plating technique in investigations of the lethal effect of ionizing radiation on mammalian cells. Problems under study include the relative biological effectiveness of 180 kvp x-rays, 0.66 mev Cesium-gamma radiation, and Th C' alpha-particles; and study of cell population survival as a function of absorbed dose in an effort to delineate the mechanism of lethality in terms of the number and size of sensitive sites within the cell, the energy deposition required to damage such sites irreparably, and the degree of recovery, if any, that may occur in sublethally damaged sites.

Radiobiology

Research in radiobiology under the direction of Professor Rugh has been largely in the field of effects of low levels of irradiation on the early embryo as revealed through (a) psychological behavior tests, (b) neuroretinography, (c) electroencephalography and (d) neurohistopathology. In addition a project has been started to determine the age of maximum susceptibility x-rays as measured by subsequent sterility, using mice from 0.5 day post-conception (embryo) through one month post-natal. A further study is being made of the long term sequelae of embryonic exposure to doses as low as 1 r, the study involving the incidence of cataract and tumor development, leukemia, blood changes, and ageing.

The research work in the department has been supported by grants from the United States Public Health Service, the Atomic Energy Commission and the United Cerebral Palsy Research and Educational Foundation, Inc.

Statistics of Radiological Service

The annual statistics for both the diagnostic and

therapeutic divisions of the Radiology department and comparison with the previous years are presented in the tables below. The volume of work has also been recorded in work units which gives a more accurate indication of the degree of utilization of space, personnel, and equipment, and indicates an increase of 20,208 work units. This reflects the rapidly increasing demand for special procedures which include gastro-intestinal examinations, arteriography, pneumoencephalography, and laminography. Thirty-two percent of the entire radiotherapy

load was treated in the betatron as compared to 26% last year. This increase in capacity is largely due to the policy of giving the same total dose in fewer fractions which seems to be a more efficacious treatment schedule. The utilization of the betatron has increased from 161 patients and 3,329 treatments in 1956, to 448 patients and 5,092 treatments in 1961. The increase in the number of diagnostic radioactive isotope studies largely reflects the increasing use of hepatic scans, renal excretion studies, and Schilling tests.

DIAGNOSTIC DIVISION:

	1961			1960		
	<i>Patient Visits</i>	<i>Exams</i>	<i>Work Units (10 mos.)</i>	<i>Patient Visits</i>	<i>Exams</i>	<i>Work Units (10 mos.)</i>
Presbyterian Hospital	55,423	62,998	180,555	54,088	61,534	175,332
Babies Hospital	10,750	12,718	29,217	10,473	13,510	28,034
Neurological Institute	8,887	15,160	47,260	7,285	13,564	41,868
Harkness Pavilion	27,910	34,130	97,617	26,554	32,989	93,223
Urology	5,683	5,868	32,858	5,131	5,394	29,389
Ophthalmology	798	1,230	3,280	647	1,070	2,733
Chest Survey	14,292	14,292	—	13,436	13,436	—
	<u>123,743</u>	<u>146,396</u>	<u>390,787</u>	<u>117,614</u>	<u>141,497</u>	<u>370,579</u>

RADIOTHERAPY DIVISION:

	1961		1960	
	<i>Treatments</i>	<i>Patients</i>	<i>Treatments</i>	<i>Patients</i>
Total	15,425	1,392	15,735	1,468
Radium	78	75	79	76
Betatron	5,092	448	4,676	385

<i>Isotopes</i>	<i>Diagnostic Tests</i>	<i>Treatments</i>
I ¹³¹	411	1
Au ¹⁹⁸	263	3
Cr ⁵¹	25	
Co ⁶⁰	125	
Hg ²⁰³	11	
P ³²		<u>10</u>
		14



Surgery

GEORGE H. HUMPHREYS, II

Mott Professor and Chairman of the Department · Director of Service*

DAVID V. HABIF

*Associate Professor of Clinical Surgery and Acting Chairman of the Department
Acting Director of Service*

One of the most important obligations of a University Hospital is the training of surgeons for a career in teaching, research and patient care. Many who are interested in an academic career are unable to obtain a suitable university appointment immediately upon completion of the residency period and thus are forced to enter private practice. For the past three years, this department has been providing that opportunity for its residents interested in academic surgery and accordingly its staff of strict full time

surgeons has been increased by the appointment of four new members.

Staff Changes

Three members retired, four new appointments to the staff were made and two resigned. Two members changed status from geographic to strict full time.

On July 1, 1961, the department suffered a real loss through the retirement of Professors Rudolph

* On sabbatical leave October 1, 1961 to March 31, 1962.

N. Schullinger, Lawrence W. Sloan and Richmond L. Moore. Professor Schullinger received his education at Princeton University and the College of Physicians and Surgeons. Professor Schullinger, with the rank of Lieutenant-Colonel, was Chief of the Surgical Section of the Second General Hospital (Presbyterian Unit) during World War II and was awarded the Legion of Merit for outstanding service. He was discharged from active duty as a Colonel. Many other honors were given him among which were President, P & S Alumni Association, and recipient of the Alumni Medal for Meritorious Service (P & S) 1961. He is a Trustee of The Brook Foundation and a Life Trustee of Princeton University. Professor Schullinger was associated with this department for thirty-six years as an outstanding teacher of medical students, Interns and Residents. He continues this association as honorary member of The Medical Board, Professor Emeritus, and Consultant to the Hospital.

Professor Sloan received his education at Harvard College and Medical School. During World War II, Major Sloan served as Executive Officer and later as a Lieutenant Colonel, Chief of the Surgical Section of the Second General Hospital. Professor Sloan served as Executive Officer of the Surgical Service from 1945 to retirement. He has received worldwide recognition for contributions to the knowledge of the surgery of thyroid disease, particularly cancer. He continues as Professor Emeritus, Consultant to the Hospital and honorary member of the Medical Board.

Professor Moore received his education at the University of Virginia and the Harvard Medical School. Observations he recorded thirty to thirty-five years ago on pulmonary physiology stand as reliable guides today. Professor Moore was responsible for introducing the concept of thoracic surgery as a specialty in Presbyterian Hospital. He served with the Second General Hospital during World War II, was later Chief of the Surgical Service at Hal-loran Army Hospital, and was discharged with the rank of Lieutenant Colonel. Thereafter, he returned to his post of teaching and clinical responsibilities in the general and thoracic surgery sections, rising to the rank of Associate Professor of Clinical Surgery and Attending Surgeon. He continues his association as Consultant to the Hospital and teacher.

On May 1, 1961, Dr. George Kleinfeld was appointed Instructor in Surgery and Assistant Attending Surgeon. His special interest is head and neck surgery and he is assigned to that section at both Presbyterian and the Francis Delafield Hospitals.

On July 1, 1961, Drs. Frederick O. Bowman, Jr.

and John B. Price were appointed Instructors and Assistant Attending Surgeons. On October 16, 1961, Dr. Robert S. Shaw was appointed Instructor in Surgery. The 1960 report noted that Dr. Sanford G. Weissman had resigned as Instructor in Surgery and Assistant Attending Surgeon to enter practice in Connecticut on December first. Dr. Weissman continued his association with the department until June 30th when he accepted an appointment as Instructor in Surgery at the Albert Einstein College of Medicine.

Dr. Arnold Mittleman, who was appointed Instructor in Surgery, Assistant Attending Surgeon in Presbyterian Hospital and Assistant Visiting Surgeon at Francis Delafield Hospital on May 1, 1961, resigned on June 30th to accept a full-time position at the Roswell Park Memorial Institute in Buffalo, New York.

Teaching

The introductory course in surgery at the second year level was changed in order to provide the students with greater patient contact and to have smaller groups for each instructor. This change in emphasis was continued in the third year where the students were assigned to the adult ward services rather than the outpatient department. One instructor taught a group of two or three students on each of the three services during a period of two and one-half weeks. The fourth year program was changed completely from preceptor teaching and ward work to a closely supervised substitute internship. It is possible to accommodate four students at a time for a period of two months. It has been found that the "fulltime" association with patients, house and attending staffs and the operating rooms, plus some responsibility, leads to a most instructive and stimulating experience for the student. The surgical services of Francis Delafield, St. Luke's, Roosevelt, Bassett, and the Columbia Division of Bellevue Hospitals continue to play a vital role in our teaching program at the fourth year level, offering the same type of internship.

Research

Professor James R. Malm, with Professor George H. Humphreys, II, and Dr. Bowman, has expanded the clinical open heart surgical program during the past year under a continuing grant from The John A. Hartford Foundation, Inc. In collaboration with Dr. Sidney Blumenthal, Professor of Clinical Pediatrics and Attending Pediatrician, a clinical evaluation of the surgical treatment of congenital heart disease in infants has been carried out and, with the addi-

tional assistance of Dr. José Strauss, Fellow in Pediatrics, a study of renal function and electrolyte requirements following open heart surgery is in progress. Professor Malm, with Dr. Donald Lindberg, Assistant Resident in Pathology, now of the Department of Pathology, University of Missouri, made a study of silicone embolization during extracorporeal circulation and with Dr. John B. Henry, now of the Department of Pathology at the University of Florida, completed a clinical pathological study of intracardiac tumors. Dr. Louise L. Phillips, Research Associate in Obstetrics and Gynecology, and Professor Malm completed an evaluation of coagulation defects following extracorporeal circulation which indicated that a fibrinolytic mechanism was primarily responsible.

Professor Malm with Dr. Richard F. Sabbia, Assistant in Pathology, Drs. Ronald N. Ollstein, William H. Fleming, William V. Healey, and Mr. Charles Smith continue studies related to the insertion of prosthetic materials within the heart. An experimental evaluation of the establishment of pulmonary hypertension and its reversibility, initiated by the late Professor Aaron Himmelstein, is being continued by Professor Malm and Dr. Paul H. Gerst. Professor Malm, in association with Dr. Gabriel Nahas, Associate Professor of Anesthesiology, with the collaboration of Drs. Bowman, Gerst, Richard W. Patterson, Assistant Professor of Anesthesiology and Assistant Attending Anesthesiologist, and Stuart F. Sullivan, Instructor in Anesthesiology and Assistant Anesthesiologist, have begun an experimental study of the correction of acidosis in deep hypothermia under a grant from the National Institutes of Health.

Dr. Gerst with Professor Humphreys continue their research concerning certain aspects of pulmonary function which are important in the management of surgical patients. Attention is being directed to the effects of ventilation by positive pressure devices, as applied to post-operative and post-traumatic patients. The results to date suggest that although this technique may lead to adequate ventilation of the lungs, it can actually cause serious disturbances of respiratory gas exchange at the alveolar level owing to impedance of blood flow through the pulmonary capillaries. Dr. Gerst and Professors Humphreys and Malm have initiated a study of the effects of hypothermia upon pulmonary function and its effects upon the gas-carrying and gas-exchanging properties of blood. The information obtained will be vital for the proper care of patients undergoing open heart surgery where deep levels of hypothermia are sometimes employed.

Dr. Robert F. Shaw, Professor Humphreys, and Dr. Lawrence H. O'Neill, Professor of Electrical Engineering and Director of the Electronics Research Laboratory of the Columbia School of Engineering, with Dr. John B. Walsh, Assistant Director, Electronics Research Laboratory, have continued their efforts toward the development of an electromagnetic blood flowmeter. The cooperative effort begun during 1960 has resulted in the creation this year of a Section on Medical Engineering in the Electronics Research Laboratory, with the advice of Dr. Shaw. This facility enables medical and physical scientists to apply jointly their disciplines to medical problems. The predominant effort to date has been the investigation of the phenomena of blood flow measurement by electromagnetic induction. The flowmeter is being developed for use in measuring instantaneous blood flow in laboratory animals, patients during surgery, and rocket and space borne subjects. A study has been initiated in the use of analogue computer techniques in the analysis of coronary and pulmonary blood flow, and another on an arterial counter-pulsation pump system to support the failing heart.

Drs. Shaw, John Ross, Jr., and Mr. Paul Mosher have completed a study of the relation of blood flow through the myocardium to coronary perfusion pressure. An intrinsic auto-regulatory phenomenon was demonstrated by which the heart adjusts coronary blood flow to meet its needs, independent of perfusion pressure over the physiological blood pressure range. Dr. Shaw with Mr. Arnold S. J. Lee has developed a pneumatic blood reservoir which will convert positive displacement pumps used in regional and total body perfusion to constant pressure systems. Dr. Shaw continues his investigations of the development of coronary collateral circulation and the effect of revascularization operations on the heart. In collaboration with Dr. John B. Price, hemodynamic studies of blood flow through the liver are in progress to characterize the hepatic vascular bed as a flow network and elucidate the hepatic artery-portal vein interrelationship.

Professor Ferdinand F. McAllister is continuing long term experimental studies on factors influencing peripheral atherosclerosis and has assumed responsibility for the peripheral vascular clinic and section. With Dr. Edgar C. Hanks, Assistant Professor of Anesthesiology and Associate Attending Anesthesiologist, and Dr. Hamilton Southworth, Clinical Professor of Medicine and Attending Physician, Professor McAllister introduced the method of closed chest cardiac massage and resuscitation to the Medical Center.

Professor Arthur H. Blakemore and Dr. Arthur B. Voorhees, Jr., have continued their studies related to portal hypertension. Following an experimental evaluation of the Marion-Clatworthy inferior vena cava to superior mesenteric vein shunt for decreasing portal bed hypertension, they have done the operation successfully on more than thirty patients, the world's largest series. The procedure is a most effective one for decompressing the portal bed when all other shunts fail or are impossible, including the portal vein to vena cava shunt worked out by Professor Blakemore more than fifteen years ago. Dr. Stephen L. Wangenstein, Professor Blakemore, and Dr. Voorhees have continued the clinical assessment of gastro-esophageal hypothermia for the control of upper gastro-intestinal hemorrhage. Complete control was achieved in eighty-five percent of forty-two patients. Bleeding was controlled in all sixteen patients with esophageal varices. A single lumen radio-opaque latex balloon designed specifically for the control of bleeding varices has been developed and is in use. It promises to be a most important contribution for the control of variceal bleeding, where some fifty percent of patients with cirrhosis of the liver die following the first hemorrhage if no treatment is given.

Dr. Wangenstein, Mr. Richard C. Orahod, Mr. Wallace K. Luke, and Dr. William V. Healey, supported by a grant from the National Institutes of Health, in further experimental studies relating to the use of intragastric cooling, have documented a thirty percent decrease in estimated hepatic blood flow. Dr. Wangenstein, Mr. Orahod, and Mr. Luke found a thirty percent reduction in renal blood flow associated with inflation of the gastric balloon with non-chilled fluid and only a minor further reduction when chilled fluid was used. On the other hand, glomerular filtration was suppressed with gastric hyperthermia and not balloon inflation. Regardless of the experimental conditions, urinary output was apparently unaffected. Studies were completed during the year showing that the hematocrit was not a reliable guide to blood replacement in the dog subjected to gastric hypothermia and normal body temperature. There was a seventy percent rise in hematocrit, a fifty percent reduction in plasma volume, and a thirty percent reduction in total circulating blood volume. The clinical implications are apparent. The dog's liver has been found to handle normally a load of ammonia introduced into the intestine under conditions of gastric hypothermia. Finally, Dr. Wangenstein and associates have completed an experimental evaluation of hepatic blood flow using radioactive colloidal gold and plan to use

the method to study hepatic flow in patients with cirrhosis of the liver at the time of esophageal varix hemorrhage.

The Laboratory for Cell Physiology, under the supervision of Professor Margaret R. Murray, has continued its activities in the area of training personnel and basic research. A long-term project concerned with cancer etiology is being continued by Professor Etienne Y. L. Lasfargues, Assistant Professor of Microbiology, in collaboration with Professor Dan H. Moore and Dr. G. Miroff of the Rockefeller Institute. Professor Cushman D. Haagen's mouse colony continued to supply milk for these studies. The Rockefeller group is engaged in chemical characterization of the transmissible agent of mouse mammary carcinoma; Professor Lasfargues is attempting to characterize the physiological — especially the hormonal — factors which govern the response of the mammary gland to this virus. A second very active project is concerned with the normal production of the myelin sheath, and its disintegration in various disease conditions. Dr. Olivier Perier of the Pathology Department, University of Brussels, while spending three months in the laboratory, began a study of the action of lysolecithin upon the cultures of myelinated rat cerebellum, finding that this normally occurring phospholipid with detergent properties can bring about a lysis of the myelin sheath at a concentration which still allows neurons and neurites to survive. Dr. Gerald B. Phillips, Associate in Medicine assigned to Biochemistry, who first isolated lysolecithin from normal human serum, gave valuable aid. Mrs. Edith R. Peterson has been studying the direct effects of diphtherial toxin upon cultures of myelinated dorsal-root ganglia. She finds a pattern of myelin disintegration that follows closely the course of diphtherial polyneuritis *in vivo*. It can be prevented in the cultures by simultaneous administration of antitoxin. She has demonstrated the reality of the disputed "Schmidt-Lantermann clefts" in normal medullated nerve fibers by photographing them in the same fiber, both living and fixed. These clefts and the nodes of Ranvier become centers of myelin breakdown in cultured nerve fibers exposed to diphtherial toxin. Dr. Richard P. Bunge, Visiting Fellow in Surgery, in his second year of a National Multiple Sclerosis Society fellowship, with his wife, Dr. Mary B. Bunge, who holds a second year post-doctoral fellowship from the National Institutes of Neurological Diseases and Blindness, have completed for publication both an electron microscopic study of demyelination and remyelination in adult cat spinal cord following an experimental traumatic lesion, and

a brief comparative study of normal myelin development in kitten spinal cord. From these observations, they have developed a schema representing the spiral wrapping of a single glial process around the axon to form a segment of lamellated myelin sheath, which thus remains in continuity with the glial perikaryon. Dr. Stanley Crain, Assistant Professor of Anatomy assigned to Neurology, has begun a study of electrophysiological activity in cultured neurons visualized directly under the high power microscope.

Dr. Mary S. Parshley, under a National Institute of Health grant, has pursued her studies directed toward the isolation of a growth inhibitor specific for tumor cells. Inhibitors have been demonstrated by tissue culture methods in fluids following mild tryptic digestion of normal adult tissue of mesenchymal origin. These extracts have inhibited growth of normal fibroblasts, the cells of several human tumors, and a hemolytic streptococcus. It is assumed that these agents, in balance with stimulators, also demonstrable, may account for the dormancy of these tissues under normal conditions and their slow growth *in vivo*. Dr. Parshley has been able to further characterize some of these agents. Results obtained with a series of tumors treated with inhibitors indicate that extracts from beef tendon, adult chicken, dog aorta, and pectoral muscle inhibit fibroblasts but not epithelium from a human carcinoma of the breast. Pectoral muscle extracts, but not that from aorta or tendon, completely inhibited a cystosarcoma of the human female breast. Calcium chloride precipitates were also one hundred percent inhibitory. In contrast, an extract of this tumor prepared by the same method stimulated the growth of normal fibroblasts. These results support the idea of complexes of stimulators and inhibitors variable in nature and balance in different tissues, both normal and abnormal. A second long term project concerns the histochemical study of normal blood vessel endothelium in tissue cultures. Mrs. Grace Lew and Miss Jeanne Willner have been chiefly responsible for working out a number of procedures which, if not specific, appear to distinguish endothelium from fibroblasts. One, an alkaline phosphatase method, appears to be specific.

Professor Robert B. Hiatt has continued studies related to the pharmacological action of serotonin placed intra-luminally in dog ileal segments. Serotonin activity has been found to be inhibited by a mechanism which is under the influence of the central nervous system connections in the gut. More work is required to confirm and extend this important observation. In collaboration with Dr. Irving Goodman, an organ bath preparation, using rat

ileum, has been devised which makes possible the study of certain protein radicals of smooth muscle that control contraction. Sulfhydryl linkages in the protein molecule have been found to be most important in this regard. With Dr. Leonard Katz (now at Abraham Jacobi Hospital in the Bronx), a survey has been completed of mast cells in pathological conditions of the intestinal tract. There is a consistent increase in mast cells in the so-called non-specific inflammatory processes such as peptic ulcer, regional enteritis, and ulcerative colitis. It was also demonstrated that these cells were increased in patients with spastic colitis. This is the first time that the mast cell has been found to be increased in a condition in which fibroplasia is not a predominant element, and is another indication that this cell has a role other than supporting fibroplasia.

Professor Paul S. Russell has continued his studies of tissue transplantation biology with special emphasis on studies of the graft versus host reaction in mice and the importance of the recipient site to the survival of foreign tissue grafts. In the former study, a variety of means of modifying the reactivity of immunologically competent lymphoid cells has been tested. It has been found that these cells can be destroyed by certain immunologic manipulations even after they have been transferred by injection into a newborn recipient animal. Cortisone treatment, whole body irradiation, and various drugs have also been tested for their ability to destroy or alter these important cells. Most striking is the effect of α -methopterin, which will allow such a population of adult cells to be rendered specifically tolerant of foreign tissue antigens when such antigens are present in excess. These findings may prove to be of value at a clinical level but at the very least they have opened up many possibilities for further investigation. The second study involves the use of parathyroid glands as grafts into previously parathyroidectomized rats, the level of the serum calcium serving as a measure of the viability of the graft. A wide variety of sites is being tested using genetically standardized inbred strains of rats. The anterior chamber of the eye, the brain, and the testis appear to be relatively privileged sites for grafts.

Dr. Douglas G. Gilmour, Lecturer at the University of Cambridge School of Agriculture, and a recognized authority on the immunogenetics of birds, joined Professor Russell's laboratory with the aid of a grant from the New York City Health Research Council. He has begun an analysis of mixed populations of cells of different genetic derivation by means of fluorescently tagged antibodies.

Dr. Richard L. Simmons and Professor Russell

have almost completed a study related to the placenta as a natural homograft to the mother. The hypothesis that there is a "buffer zone" free of homo-transplantation antigens in the placenta was tested. Evidence has been found to support this idea in that the primary trophoblast of the mouse is peculiarly able to survive where other tissues of embryonic origin are destroyed.

Dr. Healey and Professor Russell, in collaboration with Drs. Marlow Olsen and Kim Poole of the United States Department of Agriculture Research Center at Beltsville, Maryland, have demonstrated a new type of genetic histocompatibility by the use of grafts exchanged between "parthenogenic" turkeys and their dams. One hundred percent of a statistically significant series of grafts took from these fatherless offspring to their mothers while grafts in the reverse direction were all rejected. This work lends strong support to the occurrence of parthenogenesis in the Beltsville turkey strain and has been helpful in further understanding of the nature of this remarkable example of virgin birth.

Dr. James G. Chandler, in association with Professor Russell, has been conducting certain experiments to further analyze the phenomenon of acquired tolerance of foreign cells. They are investigating the sex-linked tissue incompatibility antigen in inbred strains of mice and are interested in several features peculiar to this tolerance system, particularly with respect to the apparent dissociation between tolerance and chimerism. They are also investigating the possibility of chimerism-tolerance dissociation in simultaneous tolerance to multiple strains in one host. Dr. Chandler, in association with Dr. John G. Gorman, Associate in Pathology and Assistant Pathologist, has formulated a theory of the underlying mechanism of tolerance and its relation to the total immunological response of the body as an alternative to the more widely held explanation of acquired immunological tolerance.

Professor Harold G. Barker continues to direct the experimental and clinical physiological, biochemical and metabolic studies in the metabolism research unit. With Drs. Frank E. Gump and Robert L. Beals, the evaluation of segmental fat absorption in dogs was completed this year. Radio-active fat and fatty acid were introduced into the dog's stomach and suggestive evidence was found that a considerable portion of neutral fat is absorbed in the form of undigested fat predominantly from the proximal small intestine. When the jejunum is isolated from the intestinal stream, absorption of neutral fat does occur at a slower rate from the ileum following enzymatic digestion. Another experimental study

related to the effects of acidosis on adrenal function and blood flow was completed in association with Dr. Arnold Mittelman, Dr. Serge J. Dos, research worker in Anesthesiology, and Professor Nahas. Dr. Gump and Professor Barker are continuing a restudy concerning the permanent effects of vagotomy in dogs where gastric pouches were created for the collection of secretions. Drs. Beals, Joseph A. Buda, and Professor Barker are continuing an evaluation of the usefulness of the small intestinal musocal biopsy obtained with a swallowed tube. Dr. Gump, Dr. Michael J. Lepore, Assistant Clinical Professor of Medicine and Assistant Attending Physician, and Professor Barker have found through radioactive fat absorption studies that low absorption curves in patients with regional enteritis are most clearly related to recurrent disease than to the amount of small intestine previously resected. This study was part of a long term evaluation of various aspects of intestinal absorption in patients with mal absorptive conditions. Professor Barker is continuing the long term study of the etiology and surgical treatment of patients with cirrhosis of the liver and ascites. The various aspects of the metabolic response to portacaval shunt surgery have been characterized. In addition to the metabolic studies, steroid levels in the blood and urine have been determined in association with Dr. Mittelman in order to characterize the adrenal response. The information gathered to date demonstrates a pattern which permits more accurate prediction of the operative risk involved in attempting a shunt in patients with advanced cirrhosis and ascites. Dr. Voorhees, Professors Blakemore and Barker continue to assess the blood ammonia level in the clinical management of patients with cirrhosis prone to hepatic coma and methods by which a high level may be reduced. Professor Barker and Dr. Wangenstein have initiated a study of the influence of gastric hypothermia on intestinal absorption.

Professor Frederic P. Herter and Dr. Alfred M. Markowitz have continued their study of isolation perfusion techniques in cancer chemotherapy. The technical aspects of perfusion and infusion have been perfected to a large extent and definite criteria for the selection of patients have been established as a result of the experience obtained from more than 100 patients. The use of various drug combinations, combinations of perfusion and infusion, and the value of hypo-hyperthermia are all under active evaluation. Dr. Gerard A. Kaiser and Professor Herter are studying experimentally the use of autogenous bone marrow for protection against nitrogen mustard induced marrow toxicity. A dose of nitrogen mustard which will cause severe marrow de-

pression without concomitant lethal gastro-intestinal toxicity has been established. Fresh antogenous bone marrow given one to three hours after drug administration does not appear to offer significant protection when compared to a paired dog's spontaneous recovery. Professor Herter, with the help of Dr. Murlidhar K. Menda, is participating in the Clinical Drug Evaluation Program of the National Cancer Institute. New chemotherapeutic agents are administered to patients with cancer of the colon, and the information obtained correlated with that from other centers in the United States.

Dr. Markowitz and Professor Herter are carrying out a number of experiments using the V_2 carcinoma in the rabbit. Removal of the lymphatics and lymph nodes of a limb with simultaneous or delayed inoculation of cancer cells into the limb appears to decelerate rather than accelerate tumor growth. Other aspects of the study are: an evaluation of the natural growth of the V_2 carcinoma in the rabbit, the mechanisms involved in metastatic spread, the definition of the phenomenon of weight loss and debility in the presence of still localized disease, and the effects of alkylating agents on tumor growth.

Drs. Robert A. Salerno, Healey, Hassan Tabbarah, Professors Herter and Russell are developing a system which may permit long-term survival of isolated organs by perfusion. Many technical and biochemical considerations will have to be worked out, but it is hoped eventually to produce a model preparation by which normal and cancer involved organs can be kept viable long enough to assess the influence of various factors on the neoplastic growth.

Drs. Carl R. Feind and Markowitz continue their evaluation of isolation perfusion in patients with cancer of the head and neck region. By using body hypothermia and head and neck normothermia, it has been proved possible to administer more than twice the dose of drug without profound bone marrow depression. The mechanism of bone marrow protection by this method is under study. Methotrexate by infusion has resulted in the best regression of the tumors, but a second course of the drug given orally has produced as good a response in two patients and a controlled study has been instituted to assess this.

Drs. Feind and Markowitz are also attempting to obtain complete head and neck isolation during perfusion by raising the epidural pressure to 18 mm. mercury in order to occlude the vertebral veins. The use of antimetabolites by long-term intra-arterial infusion has resulted in transient relief of pain and reduction in tumor size. If the problem of escape of drug through the vertebral veins can be overcome,

a program will be established which first uses alkylating agents, then antimetabolites, and finally surgery or radiotherapy for those patients with advanced head and neck cancer.

Drs. Feind and Markowitz, in association with Dr. Algernon B. Reese, Clinical Professor of Ophthalmology and Attending Ophthalmologist and Pathologist, Dr. Robert M. Ellsworth, Instructor in Ophthalmology and Assistant Ophthalmologist, Dr. George A. Hyman, Associate in Medicine and Assistant Physician, Dr. Patricia Tretter, Instructor in Radiology and Assistant Radiologist, and Dr. James A. Wolff, Associate Professor of Clinical Pediatrics and Associate Attending Pediatrician, are treating children with advanced retinoblastoma confined to the eye with a combination of intra-arterial triethylene melamine and radiotherapy. Isolation perfusion and radiotherapy are being evaluated in the more advanced cases of optic nerve and orbital involvement while those with generalized disease are receiving combined triple chemotherapy.

Dr. Feind is continuing the study of the lymphatic spread of cancer of the head and neck by dye injections and lymph node clearing techniques and has developed a new incision and approach for removing tumors of the tonsil alveolar ridge of the mandible, the floor of the mouth, and the lateral tongue.

Drs. Charles A. Slanetz, Jr., and Hyman are determining the distribution and fate of labelled Cytoxan following interval carotid injection in rabbits. Dr. Slanetz and Professor Herter are completing a critical review of 1,200 cases of carcinoma of the colon and rectum.

Dr. Richard L. White, in collaboration with Professors Barker, Herter, and David V. Habif, has initiated an *in vivo* study of experimentally implanted tumor and human tumor growth rates and their alteration by various forms of treatment, including radiotherapy, hormone administration and ablation, perfusion and infusion techniques, etc. Multiple miniature Geiger-Mueller probes will be embedded in the tumor mass P^{32} injected intravenously, and the turnover rate of P^{32} determined. Dr. White, in association with Dr. William Gross, Assistant Professor of Radiology (Physics), is conducting preliminary tests on an apparatus for measuring Gamma and Beta radiation *in vivo* by means of a photosensitive crystal mounted on the end of a fiber optic "light pipe" clad by a plastic 6 F catheter. The apparatus was produced for them by the American Optical Company.

Professors Habif and Nahas, Dr. Emanuel M. Papper, Professor of Anesthesiology and Director of

Anesthesiology Service, Dr. William M. Manger, Instructor in Medicine and Assistant Physician, and Dr. Driss Hassam, research worker in Anesthesiology, continue their studies of the effect of pH control on the course of experimental hemorrhagic shock. The use of a combination of the amine buffer, Tris hydroxy methylamine methane and sodium bicarbonate, along with one hundred percent oxygen, results in a highly significant survival of dogs subjected to hemorrhagic shock as compared to the control group. With Dr. Walter Ploski, Research Associate in Anesthesiology, the study has been extended to an evaluation of patients undergoing operative procedures which require six or more units of whole blood. Dr. Gump, with Dr. Beals and Professor Habif, developed an intra-intestinal pulse pickup apparatus for recording pulsatile intestinal blood flow. The sensitivity and reliability of the instrument were proven experimentally, and modifications of the tube to allow transnasal passage in patients suspected of having "intestinal angina" are in progress. Drs. Healey and White, with Professor Habif, completed the evaluation in the dog of a multiple detector gastro-intestinal tube for localizing the source of bleeding, and clinical trials are under way. Twenty tiny Geiger detector tubes are incorporated in a seven foot long tube, developed in collaboration with the Anton Laboratories, which may be introduced transnasally and allowed to progress the length of the bowel. Some five patients have been studied to date, and the information obtained indicated the tube will be a reliable method of localizing bleeding from an occult source which is not radiographically demonstrable and which source heretofore had to be determined at an exploratory operation. The development of this equipment is another example of the value of a cooperative effort between the sciences of electronic engineering and medicine. Drs. Sven J. Kister and E. Foster Conklin and Professor Habif have continued the experimental and clinical evaluation of chronic lymphedema following regional lymphnode extirpation. Permanent lymphedema, comparable to that which occurs in the human, has never been created in an experimental animal. It has been possible to produce lymphedema of the dog's hind limb by a combination lymphatic extirpation and the intermittent injections of sclerosing solution into the subcutaneous space of the groin and maintain the edema, in the absence of infection, for approximately five months to date. The experimental work done in association with Dr. Ralph Schlaeger, Assistant Professor of Radiology and Assistant Attending Radiologist, will be extended to determine regeneration of lymphatics, the role of

infections and its cure, and radiographic and pathological studies of the edematous limb. The role of venous obstruction in conjunction with lymphatic blockage in causing swelling of the arm following radical mastectomy is being completed with the help of Dr. Gerhart S. Schwarz, Assistant Professor of Radiology and Assistant Attending Radiologist. Drs. Kister and Conklin have continued to refine techniques for the radiographic demonstration of lymphatics in the human and, with Dr. Harold L. Atkins, Associate in Radiology and Assistant Radiologist, are extending the technique of studying lymphatic function with radio-active iodinated serum albumin previously devised by Professor David M. Ju and continued by Professor Habif. Dr. M. Richard Maser and Professor Habif are currently engaged in a clinical double-blind study of the value of bovine fibrinolysin for debridement of topical wounds such as ulcers, burns, abscesses, etc. Dr. Conklin and Professor Papper have developed a new method for monitoring the vital signs of patients undergoing operation for pheochromocytoma. The method consists of the electronic recording of pulsations from an intra-arterial cannula, and, after trials in the experimental laboratory, has been employed successfully in one patient to date.

Drs. Healey, White, and Ronald Ollstein, in association with Dr. Robert S. Grinnell, retired Assistant Professor of Clinical Surgery, and Dr. Edith H. Quimby, Special Lecturer in Radiology, completed a study of the incorporation of radioactive phosphorus in the intestinal tumors of twenty-five patients. They established the fact that P^{32} is incorporated in the tumor at a concentration 1.5 to 3 times the normal colonic mucosa. Drs. Healey, Wangenstein and Ollstein and Miss Balbina A. Johnson completed an experimental evaluation of the change in the bacterial flora of the bowel comparing general body with gastric hypothermia. The study consisted of obtaining some 1,600 cultures on aspirates from various levels of the intestinal tract and demonstrated that there is a significant increase in the number of coliform organisms in the stomach, duodenum and small intestine when gastric, but not general body hypothermia ($8-10^{\circ}$ F. below normal) is used.

Professors George F. Crikelair and José M. Ferrer, with Dr. Charles L. Fox, Jr., Assistant Professor of Microbiology (Surgery) and Dr. Ramon S. De-Jesus, are continuing their studies of hypothermia in the treatment of burns using radioactive Krypton as a tool, supported by the New York City Health Research Council. Dr. Cadvan O. Griffiths has investigated the concept of neoplastic disease simulating a

tissue homograft and a tentative correlation made of a heightened cellular immune response with antigenic specificity of given neoplasms. In addition, the definition of normal tissue antigens within tissue cells and their influence on humoral antibody formation has been defined for the first time. It is hoped that such isoantibodies may ultimately be employed in defining immunological differences between normal and neoplastic cells in man as well as in extending our knowledge of the role of humoral antibodies in transplantation immunity. As a guide to the determination of continued viability of homotransplanted cells, radioactive thymidine has been tagged to such cells, and their fate determined by radioautographs of successive biopsies of homotransplanted tissue. Dr. Griffiths has begun a review of protein anomalies in patients with head and neck and breast neoplasms studied over the past four years correlating the observed anomalies with the natural history of the disease, both treated and untreated. Drs. Lorne C. Smith and Melvin L. Moss, Associate Professor of Anatomy, have been conducting studies related to the survival of auto and homo-transplanted fibrous tissues as revealed by radioautography with thymidine H-3.

Professors Crikelair and Moss continued the clinical studies relating to the etiology of facial hemiatrophy and, with Drs. Adrian F. Bom and J. Joseph Luban, Assistant Clinical Professor of Dentistry, Professor Crikelair is investigating orthodontic movement of cleft lip repair.

Drs. Kleinfeld and Bom with Professor Crikelair are evaluating absorbable collagen film as an aid to mandibular bone grafting in the dog. Drs. Kleinfeld and John L. Conley, Clinical Professor of Otolaryngology and Attending Otolaryngologist, are studying the tumors of the infratemporal fossa region.

Dr. John F. Prudden has continued the studies of the "wound repair accelerator factor" previously demonstrated to be present in bovine cartilage. The "factor" is soluble in isotonic saline and mammalian extracellular fluid. Subcutaneous injections of a saline extraction of cartilage will cause a twenty percent increment in wound tensile strength when given on the first post-operative day, with decreasing effectiveness to nil by the fourth post-operative day. Distilled water extracts of cartilage are not effective. This unusual differential behavior in water and physiological saline has led to the chromatographic isolation a mucoprotein component which is present solely in the saline extract. This portion of the work is being pursued with Dr. Alexander Coronel, research worker in Biochemistry, and the substance is being isolated in quantity for biologic testing. The

ultimate goal is the isolation of a parenterally injectable "wound repair accelerator" for clinical use.

Professor Thomas V. Santulli, in collaboration with Dr. William A. Blanc, Associate Professor of Pathology and Associate Attending Pathologist, continued investigations of the pathogenesis of congenital atresia. With the assistance of Drs. Anthony Shaw, S. Jerome Dickinson, and Raymond A. Amoury, numerous operations have been performed on the fetus of the sheep, dog, and rabbit, and evidence has been assembled to prove that congenital atresia of the jejunum and ileum is an acquired lesion or anomaly due to an accident to the fetal intestine and not an embryologic malformation—the currently held concept. The studies are being extended to other "congenital" anomalies, the evaluation of different types of intestinal anastomoses in the growing animal, and the effect of complete lumbar sympathectomy on the onset of labor. Professor Santulli, with the collaboration of Professor Wolff and Dr. Faith Kung, National Cancer Institute Fellow, has continued the clinical investigation of neoplasms in the pediatric age group. Dr. Amoury, Professors Santulli and Ferrer are attempting to develop a biochemical method for the diagnosis of acute appendicitis.

Professor John Scudder, in collaboration with Dr. Gorman and Miss Kirsten Bak, is conducting a study of antibodies resulting from either transfusion or pregnancy which cause sensitization.

Miss Johnson, with Dr. Charles W. Findlay, Jr., has continued the evaluation of the effectiveness of the newer disinfectants and germicides in ridding the patient's environment of potentially pathogenic bacteria. She is completing a long-term study of various skin antiseptics and continues to supervise the compilation of statistics related to all staphylococcal disease and post-operative wound infections in the Medical Center.

Miss Johnson and Professor Habif are conducting a retrospective study to determine the value of prophylactic antibiotics in preventing post-operative wound infections. Drs. Frank C. Wilson, Jr., Assistant Resident in Orthopedic Surgery, James N. Worcester, Jr., Associate in Orthopedic Surgery and Assistant Attending Orthopedic Surgeon, and Miss Johnson are collaborating in a study on the Orthopedic Service, where the levels of antibiotics in wound fluid and hematomas are correlated with serum levels in some patients receiving antibiotics prophylactically.

Dr. Findlay is assessing the value of pneumomediastinum in the diagnosis and evaluation of carcinoma of the lung and esophagus as well as ana-

lyzing the information obtained from supraclavicular lymph excision biopsies.

Professor Edmund N. Goodman, with the assistance of Mr. George M. Katz, has continued the studies of the electrogastrogram in various diseases of the stomach. Using the multiple electrode method, a definite abnormal pattern has been obtained which appears to be specific for those having the post-gastrectomy "dumping syndrome." It has also been determined that there is a change in the alternating component induced by emotional reactions in the human, and this finding is being used to compare the gastric electrical behavior in patients with duodenal ulcer, gastric neurosis, and schizophrenia.

Dr. Henry Colcher, Assistant Clinical Professor of Medicine and Assistant Attending Physician, Vanderbilt Clinic, and Professor Goodman are pursuing studies to define the physiological abnormalities of hiatus hernia with and without symptoms and before and after surgical correction. The parameters being measured are acid reflux by continuous recording of the intra-esophageal pH, continuous recording of the D. C. electrical potential at the gastro-esophageal mucosal junction, and intraluminal pressure studies. With the aid of Cine radiographic techniques, Dr. Colcher and Mr. Katz have continued to evaluate various models of gastroscopes developed by them for color photography and a film library illustrating the radiographic gastroscopic and pathologic findings in various diseases of the stomach is being assembled for teaching by Dr. Colcher.

Dr. John M. Hanford, Consultant in Surgery to the Hospital, with Dr. Quimby, completed a long-term evaluation of cancer arising many years after radiation therapy for benign lesions in the cervical region. Dr. Harold D. Harvey, Professor Emeritus and Consultant to the Hospital, continues his long-term clinical research on peptic ulcer and gastric carcinoma. The follow-up study, embracing more than twenty-five years, is one of the longest and most carefully documented in the world. Dr. Shivaji B. Bhonslay is pursuing the evaluation of lumbar sympathectomy for peripheral vascular disease and Dr. Schullinger continues his annual study and report on the service's experience with acute appendicitis. Dr. James S. Todd, with Dr. Louise L. Phillips, completed a review of the surgical patients in whom hemorrhage resulted from an imbalance of the fibrinolytic system. Professor Milton R. Porter, with Drs. Robert B. Smith and Conklin, continues the clinical study of common duct exploration for choledocholithiasis in an attempt to define more clearly, indications, techniques and complications. Professor Porter and Dr. Conklin completed the study of

the influence of alcohol consumption on the prognosis of pancreatitis. Professor Grant Sanger has made a study of carcinoma of the lip and tabulated the carcinomas of the breast at Delafield Hospital.

The animal operating room of the Department of Surgery has continued under the supervision of Mrs. Elizabeth Wolff and Dr. Voorhees. During a one year period to December 1, 1961, 949 operations were performed, sharing the facilities with ten other departments.

Presbyterian Hospital

There were 260 more operations performed in 1961 than in 1960, excluding the minor procedures done in the outpatient section. The number of ward operations is forty-four percent of the total and the classification also quite similar to 1960. This large number and variety of operations makes it possible to train effectively a house staff composed of twelve interns, twenty-one assistant residents, and thirteen residents. Demand for admission to the ward service continues to be high, particularly for patients requiring complex and prolonged operations. In spite of the fact that more than fifty percent of the total operating time is assigned to the ward service, it would be desirable to provide more to minimize the patients waiting on the wards for operating space. This may be possible in 1962 through an increase in operating room nursing personnel.

With the essential help of a smoothly working team of pediatric cardiologists under the direction of Dr. Sidney Blumenthal, Professor of Clinical Pediatrics and Attending Pediatrician, Dr. Kent Ellis, Assistant Professor of Radiology and Associate Attending Radiologist, Dr. Stuart Sullivan, Instructor in Anesthesiology and Assistant Anesthesiologist, and the Cardiovascular Diagnostic Laboratory under the direction of Dr. A. Gregory Jameson, Assistant Professor of Pediatrics and Assistant Attending Radiologist, Professor Malm continues to direct the open heart surgery program. More than fifty percent of the patients are drawn from the ward services, and the continued general support of The John A. Hartford Foundation, Inc. makes it possible to provide the necessary outstanding care. The available facilities permit the scheduling of only two patients per week, but the waiting list is now so long that serious consideration must be given to expanding these facilities to accommodate three patients per week. Increased space in the blood bank along with more personnel in the bank and operating room should make this possible. While the major effort continued in the field of congenital heart disease, improved techniques and knowledge will result in

acquired heart disease receiving more attention.

The Surgical Staff is most grateful to Miss Gertrude Taylor, Supervisor of the Follow-up Clinic, for her tremendous effort toward the effective operation of a clinic which has an ever increasing number of patient visits. During the year there were 7,579 visits. The general Recovery Room in Presbyterian Hospital accommodated 11,627 patients during 1961. The Open Heart Recovery Room took care of 107 patients, with a total of 574 patient care days. The Recovery Room in Babies Hospital admitted 2,100 patients.

PATIENT CARE STATISTICS

TOTAL OPERATIONS	1959	1960	1961*
Surgical Service	6,486	7,434	7,694
Per Cent Ward	45%	44%	44%

CLASSIFICATIONS

Thyroid	357	368	385
Gastrointestinal	651	661	674
Appendix	199	200	160
Gall Bladder, Pancreas...	469	510	543
Hernia	555	565	578
Other Abdominal	505	525	516
Rectal	392	403	429
Thoracic & Cardiovascular	357	364	384
Breast	598	612	633
Plastic		793	824
Other Superficial	1,169	1,182	1,198
Head & Neck		312	323
Pediatric	931	939	1,047
RECOVERY ROOM	10,717	11,196	12,566
TRANSFUSIONS	12,146	13,473	12,498

Francis Delafield Hospital

The clinical load of the surgical service at the Francis Delafield Hospital was about the same as in 1960. There were 813 admissions to the hospital and 594 operations with 68 endoscopies. There were an additional 5,932 outpatient visits. The assistant residents from Presbyterian Hospital continue to rotate through Delafield in their first year of training and the final six months of the senior residency is also spent there. This facility is excellent for the training of our house officers.

In addition to the comprehensive house staff training program, under the responsibility of Professor Sanger, Assistant Director of Surgery, fourth year medical students have been provided with the opportunity to serve as sub-interns and clinical clerks since June 1961. The experience is valuable even though the patients have predominantly neoplastic diseases.

Bellevue Hospital

The Columbia Division (First Surgical) at Bellevue admitted 2,558 patients and there were 549 operations. A surgical consultation clinic, held daily, was established to augment attending coverage in the Out-Patient Department.

Drs. S. Jerome Dickinson and George N. Haynal joined the staff as Assistant Visiting Surgeons. Dr. Frederick P. Randall, Assistant in Surgery, Columbia University and Assistant Visiting Surgeon, Bellevue (1960), was appointed Assistant Director of Surgery and Visiting Surgeon at Harlem Hospital effective December 7, 1961.

In June 1961, the substitute internship-extern program was expanded to accommodate eight fourth year students. Three students — from the Universities of Virginia, Boston, and Rochester — were accepted for training this year.

The research program under the direction of Professor Ferrer has been expanded during the year. Dr. Charles L. Fox, Jr., Assistant Professor of Microbiology and Associate Visiting Pathologist (Bellevue), and Dr. Herbert Singer, Research Associate in Surgery, were appointed January 1961. Studies related to burns are being pursued actively at the laboratory, experimental and clinical levels.

The lecture-seminar series initiated in 1960 was continued this year and 24 were held with invited speakers from as far away as California and Birmingham, England.

A library fund in memory of Dr. Philip C. Potter, late Consulting Surgeon to the Division, was established and contributed to generously by his many friends. Many surgical textbooks have already been purchased and added to the shelves of the Kenneth M. Lewis Sr. Library, dedicated in September, 1960.

The clinical, office and scientific facilities have been strengthened considerably by the purchase of very necessary equipment through a generous contribution of Mr. Macdonald Mathey.

The rotation of the assistant residents of Presbyterian Hospital for a two year period following the internship and one year of assistant residency at Bellevue continues to be a most satisfactory arrangement for both Services.

Mary Imogene Bassett Hospital

This hospital, located in a rural community, continues to function as though it were in a university setting. The clinical, teaching and research facilities are constantly improving and expanding.

During the year, 2,724 surgical procedures were performed. One assistant resident in surgery con-

tinues to receive a year of training at Presbyterian Hospital and our fourth year medical students benefit from an elective clerkship. Fourteen students served as subsidiary house officers and participated actively in all the affairs of the Service.

The major effort of research, in association with the other services there, continues to be in the field of transplantation biology. Methods of altering homograft reactions as they relate to transplantation of the lung, heart, kidney and skin have been studied. Experimental studies related to coronary arteriography and circulation and open cardiac surgery have also been undertaken. Dr. Herbert Hechtman, following a year of internship at Presbyterian Hospital, is a National Institutes of Health Fellow participating in some of the studies related to homotransplantation.

The Presbyterian Hospital surgical staff spent two days, October 13 and 14, at Cooperstown and were treated to a scientific session in which the progress made in the field of homotransplantation was discussed. The many social events were most thoroughly enjoyed and the combined staffs look forward to this event each year.

St. Luke's Hospital

There were 4,079 admissions to the Surgical Service, 3,485 operating room procedures and 19,663 out-patient visits during the first ten months of the year. Thirty-two fourth year medical students participated in the care of patients as sub-interns for a period of two months each the most popular program in our affiliated hospitals.

The surgical research laboratories continue active productive work and 469 experimental surgical procedures were performed.

Roosevelt Hospital

Twenty-nine members of the fourth year class spent thirty-nine months on the Surgical Service as sub-interns. There is a large volume of clinical material with a daily average of seventeen ambulance calls and 115 emergency department patient visits, in addition to 5,841 surgical operations performed during the year. The students are required to attend regular weekly teaching conferences in addition to a course in basic surgical technique carried out in the experimental animal laboratory.

Mount Sinai Hospital

Dr. Allan E. Kark was appointed Director of Surgery at the Mount Sinai Hospital and Clinical Professor of Surgery on July 1, 1961. Professor Kark

was Professor of Surgery and Head of the Department of Surgery at the University of Natal, Durban, South Africa. With the appointment of Professor Kark, it is hoped that the teaching facilities of the Hospital may be more closely related to the department as a whole at the undergraduate level.

Montefiore Hospital

The Hospital has a most active clinical program averaging about 6,000 surgical procedures each year. The divisions of head and neck and plastic surgery, along with urology, have been expanded and strengthened during the past year. It is still hoped that our students may some day have the advantage of the excellent clinical, laboratory research, and teaching facilities available there.

Outside Activities

Professor Humphreys began a sabbatical leave on October 1. He visited seven medical schools in Japan, lectured at four and attended the annual meeting of the Japanese Society for Thoracic Surgery. In November and December, as visiting Professor at the National Taiwan University Medical School in Formosa, he lectured, operated, conducted rounds and attended teaching conferences regularly. He addressed the annual meeting of the Medical Association of Formosa and a monthly meeting of the Taiwan International Medical Society.

Professor Humphreys was also Surgeon-in-Chief Pro Tem of the Tufts Medical School Surgical Service at The Boston City Hospital and The New England Center Hospital, Boston, Massachusetts.

The Detroit Academy of Surgery met April 13th at Presbyterian Hospital. The morning was devoted to operative clinics and the afternoon to talks by staff members. Subjects included diseases of the thyroid, breast cancer, cleft lip, portal-superior mesenteric vein shunt and pulmonary artery banding.

April 28th was the Surgical Service's Alumni Day. Forty alumni enjoyed a morning of operative surgery, afternoon lectures, and dinner at the Union Club.

The sixth John G. Gibson II lecture sponsored by The Fenwal Laboratories was given May 18th by Dr. Hugh Chaplin, Jr., Associate Dean and Assistant Professor, Departments of Medicine and Preventive Medicine, Washington University School of Medicine, St. Louis, on "Transfusion Reactions — Evaluation and Implications." The seventh lecture, "The Problem of Red Cell Compatibility," was given by Dr. P. L. Mollison, Director, Medical Research Council's Experimental Haematology Unit, Wright-

Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London, on October 19th.

The fifth Leon E. Sample Lecture, sponsored by Mrs. Jeanne A. Kerbs, was given October 12th. Dr. Jack Adams-Ray, Professor of Surgery, Royal Caroline Institute and Surgeon-in-Chief, Caroline Hospital, Stockholm, discussed x-ray television in clinical surgery and research. The staff was delighted with the presentation and apparent potential of a cine-television radiographic unit because one was installed in Presbyterian Hospital this year.

Another invited speaker, Professor Sigvard Kaae, Assistant Director of the Radium Center, Copenhagen, talked on breast carcinoma, April 13th.

Professor Ferrer was Chief of Surgery pro-tem at the Atlantic City Hospital, April 3-7.

Distinguished visitors to the department included Professors Ian Aird and G. W. Milton of London; J. J. Mason Brown, Edinburgh; Oscar Schuberth, Sweden; Tien Yu-Lin, Formosa; Sabrino Matsukura, Tokyo; Mario M. J. Brea and José M. Mainetti, Argentina; H. Mackowski, Poland, and Radmilo Tomin, Yugoslavia. Professors Sarkis A. Musegian, Chief Surgeon, and Mikhail G. Anayev, Director, Research Institute for Experimental Surgical Equipment in Moscow, along with Mr. Nikolai S. Gorkin, Chief Engineer, and Mr. Igor S. Gromov, Senior Engineer, visited us and displayed their stapling devices for the performance of anastomoses, etc.

Foreign scholars working in the department during the year were Drs. Ramon S. DeJesus (Philippines), Nubar K. Astarjian (Iraq), Murlidhar K. Menda (India), Hassan J. Tabbarah (Lebanon), Carlos E. Alvarez Herrera (Argentina), Evangelos Pappadrianos (Greece), and Yoshiaki Omura (Japan).

Members representing the department gave papers at many out-of-town meetings: Professors James Malm, International Cardiovascular Society, Dublin; Paul Russell, Ciba International Symposium on Tissue Transplantation, London, and International Conference on Mechanisms of Immunologic Tolerance, Prague; Margaret Murray, 4th International Congress for Neuropathology, Munich, and 7th International Congress for Neurology, Rome. Professor Murray also gave lectures in Prague and Bratislava at the invitation of the Czechoslovak Academy of Sciences and in Belgrade at the invitation of the Boris Kidrich Institute of Nuclear Science.

Dr. Voorhees was invited to the University of Brazil School of Medicine in October to give several lectures and demonstration operations of the inferior vena cava to superior mesenteric vein shunt.

Forty-four members of the department attended 119 out-of-town meetings and gave 115 papers.

Honors and Offices

Professor Haagensen gave the Harlow Brooks Lecture at the New York Academy of Medicine on September 25th and received the Harlow Brooks Medal. Professor Sanger assumed the office of President of the Allen O. Whipple Surgical Society. Professor Murray was awarded a Research Career Fellowship and Professor Russell a Research Career Development Fellowship of the National Institutes of Health. Dr. Gerst was awarded a Mead Johnson Fellowship for Graduate Training in Surgery through the American College of Surgeons.

Acknowledgment

The Department of Surgery acknowledges with gratitude the general financial support for research and other activities contributed by the following individuals, foundations and other granting agencies: the American Cancer Society, the Avalon Foundation, Mr. and Mrs. Harold Bach, Mrs. Albert Bostwick, Mrs. Oliver Brooks, Brook Foundation, F. Higginson Cabot Fund, Mr. and Mrs. Jacques Censor, the Damon Runyon Memorial Fund for Cancer Research, Defense Atomic Support Agency, Fenwal Company, The Fisher Chemical Company, Inc., Max Friedman Family Trust Fund, the Fund for the Advancement of Blood Vessel Surgery, Mrs. Eva Goldstein, Halsted Fund, The John A. Hartford Foundation, Inc., Mrs. John Swift Holbrook Fund, George Kantrowitz Fund, Pauline Lovering Lebell, Dr. Robert H. Lehman, Leggett and Watters Fund, Lambert Traveling Fellowship, John Lockwood Fund, Russell C. Leffingwell Fund, Mary McKay Memorial Fund, Charles E. Merrill Gift, Michel Foundation, Mr. Macdonald Mathey, Morris Milstein Foundation, Seymour and Vivien Milstein Foundation, Mary Madison McGuire Fund, National Institutes of Health, National Multiple Sclerosis Society, National Science Foundation, National Aeronautical and Space Administration, Health Research Council of the City of New York, New York Heart Association, New York Tuberculosis and Health Association, Ottman Fund, Plastic Surgery Fund, Presbyterian Hospital Alumni, Parke Davis Company, Gift for Study of Radical Mastectomy, Joyce and Robert Rosenberg Charitable Foundation, Rothschild Gift, Leon Sample Lectureship, Schenectady Varnish Co. Research Gift, Edith Emma Schweckendieck Trust, Special Fund Held for Dr. St. John, Special Fund for Open Heart Surgery, Mr. Morris Schapiro, Mr. and Mrs. Harry Schwartz, Mr. Robert Strasser, Surgical Research Gift, Surgery Endowment Fund, Tissue Culture Bibliography Fund, Mary Evelyn Townsend Fund, and Mrs. Kenneth Watters.



Urology

JOHN K. LATTIMER

Professor and Chairman of the Department · Director of Service

The 87-bed Urological Service is now fortunate in having associated with it through staff interchanges, the fifty-bed Francis Delafield Hospital Urological Service, the eighty-bed Kingsbridge Veterans Hospital Service, and the sixty-bed Public Health Service Hospital Service. By exposure to the various types of patients in these hospitals, the graduate students can learn about any type of urological disease conceivable.

Professor Emeritus George W. Fish continues as Consultant in Urology to the Presbyterian Hospital and Delafield Hospital, and as an honorary member of the Medical Board of Presbyterian Hospital. Professor Fish also continues as liaison officer between the Armed Forces and the American Urological Association, and as Consultant in Urology to

the United States Army and Military Academy at West Point. He has been elected a Trustee of the New York County Medical Society.

Professor Ralph Veenema continues as Chief of the Urology Service at the Delafield Hospital and has greatly expanded the research program there. Co-operative projects with Dr. Jacob Furth, Professor of Pathology and Pathologist at the Delafield Hospital, Dr. Samuel Graff, Professor of Biochemistry, and Dr. Seymour Lieberman, Associate Professor of Biochemistry (Obstetrics and Gynecology), have been undertaken.

Dr. Richard C. Mason, Assistant Professor of Physiology (Urology), joined the department in September 1961. Professor Mason's particular interests and experience lie in the field of renal physiol-

ogy and endocrinology. He is also interested in programmed teaching methods.

Through the generosity of the John Given and Irene Heinz Given Foundation, Professor Meyer Melicow has been able to devote more and more of his time to research in urological pathology.

Research Projects

In the Uropathology Research Laboratory of the Squier Clinic of Professor Melicow and Dr. Aurelio Uson, Professor T. Duane Price and Miss Rita Lipton placed female rats of the Fisher 344 strain on special diets as part of a program designed to study the possible role of vitamin B₆ in bladder tumor induction with the carcinogen 2 fluorenylacetamide. At the suggestion of Dr. Alton Meister, we obtained C¹⁴ L-tryptophan uniformly labeled in the ring. This was necessary since other workers have shown that only studies done with the L isomer are meaningful in humans. However, since this material is so very expensive, experiments have been undertaken to attempt to separate the L tryptophan from the C¹⁴ labeled D L amino acid.

Scientific Exhibits

An exhibit on pheochromocytoma in adults and children based on sixty-six cases (fifty-eight adults and eight children) from the Squier Urological Clinic was presented at the 110th Convention of the American Medical Association, held at the Coliseum in New York City on June 25-30, 1961. The exhibit included data from ninety-two additional cases of pheochromocytoma in children collected from the literature. The exhibit was dedicated to the memory of the late Professor George F. Cahill, who was one of the pioneers in the field of adrenal surgery. A paper on the same subject but based on 200 cases of pheochromocytomas (100 adults of whom sixty-one were seen at our hospital, and 100 children of whom nine were from our institution) is in progress. The object of this study is to emphasize not only the clinical aspects of this disease but also the difference in the clinical behavior of pheochromocytoma in adults as compared with children.

Professor Veenema and Dr. Bruno Fingerhut are developing an improved laboratory tool for the study of bladder carcinoma using the Fisher Rat. Professor Veenema is conducting a histochemical study of urological neoplasms using radioautographic techniques *in vitro* in cooperation with the Departments of Biochemistry and Pathology.

Professor Veenema and Drs. Fingerhut, Archie L. Dean, and Myron Roberts, along with the resident staff of the Urological Services at Presbyterian

and Delafield Hospitals, have continued their clinical research into the effect of topical tumor chemotherapy in bladder carcinoma. Thio-TEPA, used in ten patients with superficial bladder tumors, completely eradicated the tumors in four patients and partially destroyed the tumors in six other patients.

In cooperation with the laboratories of Professor Lieberman, Professor Veenema and Dr. Shu-Feng Cheng have given clinical trial to a steroid protein conjugate (testosterone 17). Five out of ten patients who were given this antigen developed detectable antibody levels. It is hoped to further this study by using other steroid protein conjugates in relation to prostatic carcinoma and evaluate their relationship to the hormonally refractory period which eventually develops in prostatic cancer patients.

In cooperation with the Department of Radiotherapy, the role of preoperative Cobalt 60 radiation to the bladder as an adjunct to surgery for bladder carcinoma is being investigated. The role of Cobalt 60 pelvic cycle prostatic irradiation is being evaluated in hormonally refractory advanced prostatic cancer.

Professor Veenema has been elected Chairman of the Section for Genito-Urinary Surgery of the New York Academy of Medicine for 1961-62.

Professor Hans H. Zinsser, Dr. Gerda G. Mayer and Mrs. Deborah Markow have successfully utilized an enzymatic method for determining levels of oxalic acid in the urine more precisely with an enzyme derived from wood rot fungus. It is the only specific method at present available.

Further extension of paper chromatography to the organic acids in the urine of stone-forming patients and patients that have a variety of organic acid loads was the subject of an exhibit at the American Urological Association and the American Medical Association and is, at the current time, being further refined for routine use.

Mr. Edward Kirsten has concluded his study of ultrasonic damage to the gonads of new-born mice to the eighth generation and will publish his results, which up to this time have indicated no damage at 1000x the diagnostic power range. Mr. Kirsten has also worked both with Dr. Reade at the University of Pennsylvania and in our own animal laboratories with Dr. Charles C. Wyeoff, Assistant Professor of Anesthesiology, getting better measurements of cardiac chambers and cardiac walls through the use of an ultrasonic probing technique. This equipment has also been utilized in the operating room in an effort to localize opaque and non-opaque stones within the parenchyma of the kidney at the operating table.

Mr. Igo Light has completed studies of light scattering by precipitates of calcium oxalate to study the kinetics of calcium-oxalate stone formation in further detail and has extended his studies to include the calcium-phosphate system with the help of Dr. Victor K. LaMer, utilizing conductivity methods as well as light scattering. He has made measurements of the calcium combining capacity of several mucopolysaccharides in urine and other naturally occurring products similar to sodium alginate, whose use clinically has undergone analysis by Dr. Binoy Chowdhury. A detailed analysis of calcium-combining capacity of these and other potential calcium-combining agents, as well as mucoprotein fractions in the urine isolated by Dr. Zacharias Dische, Professor of Biochemistry (Ophthalmology), and Dr. Joel Rothschild within the intestinal tract, are underway, using automatic titration methods.

Dr. Mayer has continued her study of the interrelationship of magnesium, Vitamin B₆, and calcium oxalate excretion and has verified the finding that many of the patients forming calcium-oxalate stones are in part Vitamin B₆ deficient. The large proportion of these patients are unable to absorb Vitamin B₆ by mouth, but after prolonged intramuscular administration, seem to have regained the capacity to absorb the vitamin. This will be checked with Carbon 13 labeled pyridoxine as soon as the mass spectrographic equipment is available. Work with C₁₄ in animals is already under way. Dr. Mayer has studied several samples from a case of oxalosis sent to her from Philadelphia.

Dr. Frank Longo has continued his studies of the pediatric stone problem and has studied two new anabolic steroids for their capacity to reduce uric acid excretion in uric acid stone forming patients.

With the aid of Dr. Henry Covelli, Mr. Denis Cabrillo completed his work on a sperm migration estimation apparatus and an analysis of results. Mathematical analysis of these results closely approaches in complexity some of those encountered in missile interception. Dr. Hamid Tarassoly is completing the analysis of our experience in the fertility clinic over the past five years. Mr. Thomas Arouni has completed two studies dealing with infertility caused by various drug agents, one showing the lack of late effects of heavy androgen dosage used to increase penile size in newborn rats, another showing the marked effect of nitrofurans. Dr. Covelli, Dr. Louis J. Dougherty and Professor Zinsser studied a new anti-sperm agent in man whose side effects, which resemble those of Antabus, make it unlikely of wide acceptance.

The prevention of encrustation by several new

and rather effective agents have been studied by Mr. Arouni, and clinical work with catheters impregnated with some of these agents have been carried out by Dr. John Hobart and Miss Catherine Durkin. Two new antibacterials, W.I.N. 18-320 and KEF, the latter an upside down mandelamine that releases formalin in alkaline urine, and which should be unusually powerful in urea-splitting infections, are under trial. Methods for measuring the formalin level in urine have been developed by Danny Franklin.

A detailed study of 400 cases of pyelonephritis were carried out by Mr. Logan Roots, a pre-medical student, and Mr. Arthur Lemlich, one of our medical students. It is hoped that through this analysis a more precise idea of our concept of pyelonephritis and clues to etiology and therapy may be developed.

Professor Zinsser has devised a clinical diagnosis teaching exercise using a middle sized computer, which is being tested for its value in the instruction of medical students. It is hoped that by the end of the coming year a programmed textbook in urology will be forthcoming.

The work on the final form of the film on transpubic prostatectomy was completed by Mr. Arouni and the final phases of the radioactive rubber balloon catheters for bladder irradiation were completed by Miss Elizabeth Wertz, Dr. Henry A. Azar and Dr. Al Waidh.

Robert Gollance and Mr. Light have carried out a detailed analysis of the diffraction pattern of a variety of materials likely to duplicate the findings in the ageing rat tail tendon. He has made a structure determination of aluminum acetylacetonate, which closely resembles a substance known to accumulate in the aorta.

Lloyd Kamens, a third year student, studied the route of passage of tritiated water through the rat kidney by autoradiographic techniques.

In the bacteriology laboratories of the Department of Urology, Professor Harry S. Seneca is continuing a number of studies of fundamental importance with regard to genito-urinary infections.

Professor Price has continued his work in nucleic acid chemistry field with studies as to how these compounds are synthesized and metabolized and how they compete for enzymes that normally metabolize natural nucleotides. It is hoped that this may lead to better understanding and possibly better methods for attacking the cancer cell. Professor Price has also assisted Professor Melicow in the investigation of the inter-relationship of tryptophane metabolism and bladder carcinogenesis.

The Urology House Staff won every prize in every

division of the annual contest sponsored by the New York Society of the American Urological Association to promote research in urology.

Dr. Stanley Rosenberg, a Fellow of the New York Tuberculosis and Health Association, is determining the incidence of renal tuberculosis among patients dying with pulmonary tuberculosis autopsied at Bellevue Hospital in the years since chemotherapy. He has studied flotation of tuberculosis bacilli in urine with pentane and zinc sulfate. Dr. Rosenberg is studying the effect of estrogens on atherosclerosis in men with cancer of the prostate.

Dr. Chowdhury is testing new drugs for genitourinary tuberculosis and seeking new culture techniques. He is also coordinating the cancer chemotherapy program in urological cases in the Francis Delafield Hospital.

Dr. Robert Ambrose has been working on the problems associated with horseshoe kidney, and a review of patients found to have cancer in a simple prostatectomy specimen done for clinical benign prostatic hypertrophy.

Dr. John W. Apperson has been working on the frequent occurrence of both calculi and calcifications in the kidneys. Dr. Apperson, in collaboration with Dr. William A. Blanc, Associate Professor of Pathology and Associate Attending Pathologist, is preparing a manuscript on the "Association of Congenital Deformities of External Ear and Anomalies of the GU Tract." He has also reported on three cases of severe hemorrhage in hydronephrotic kidneys of pregnancy in immediate post partum period. He is also evaluating the radioactive cystogram and cine studies in detection of ureteral refluxes and pressure at which reflux occurs, and a comparison of voiding pressures as measured by a tiny urethral catheter and suprapubic puncture.

Dr. Stanley Braham is collaborating on the development of a radiosensitive ureteral catheter for renal tests and passive pressure capsules for bladder studies.

Dr. Dean is continuing his studies of urological neoplasm in the outpatient tumor clinic, and has begun a bacteriological investigation of the normal and abnormal female urethra. Dr. Dean has also begun investigation of renal cystadenomata in an attempt to formulate a classification for prognosis and treatment. He is continuing his study of urinary incontinence control device which is effective by means of perineal compression.

Dr. J. Timothy Donovan is investigating new urinary antiseptics which are chemotherapeutic agents for treatment of Gram negative infections.

Dr. Clement A. Furey, in conjunction with the

Department of Physiology, has been working on experimental fibrotic lesion response to various cortisone products and enzymes.

Dr. Donald M. Gleason has completed his studies on the use of a miniature radio-telemeter for measurement of intravesical pressure and pressure flow study as a method for measuring bladder neck resistance. He is continuing his studies of nephrostomy pressures and emptying time, renal pelvis oscillemetrics and ureteral pressures in exstrophy of bladder.

Dr. Dougherty continues his research on undescended testes, and is actively engaged in investigating anti-spermatogenic agents.

Dr. Michael W. Justice is studying the efficacy of oxyphenbutazone in treatment of acute non-tuberculous epididymitis. He is also evaluating the epididymitis cases at the United States Public Health Service Hospital on Staten Island. Dr. Stanley Landau has developed a new high power transilluminator, two models of which have been made for our department by A.C.M.I. Dr. Landau is in the process of gathering follow-up information of fifty-four cases of functional closure of the exstrophied bladder, and is interested in the development of an improved operative technique for the prevention of ureteral reflux.

Dr. Longo is continuing his clinical investigation of synthetic anabolic steroids in reference to their effect on uric acid excretion. Dr. Longo, along with Dr. Mayer and Professor Zinsser, is also studying the effects of pyridoxine in reference to tryptophan metabolism in patients who form oxalate calculi.

Dr. Carl Pellman is investigating atypical mycobacteria and their role in genitourinary disease, and the effect of a new spasmolytic drug on bladder spasm and hypertonic neurogenic bladder.

Dr. Myron S. Roberts is studying the treatment of genitourinary infections with Colymycin, and is evaluating a new adhesive agent for genitourinary surgical procedures.

Dr. Tarassoly is continuing his study of urinary tract granuloma with Drs. Melicow and Uson and is evaluating 158 cases of carbonate containing urinary tract stones and associated infections. He is also studying the IVP using double dose contrast medium in patients with impaired renal function, for better visualization of the urinary tract.

Dr. John Hobart, Senior Resident in Urology, has been studying ureteral cine-fluoroscopy, studies of antibacterial treated catheters, and reported on silicone lubrication of resectoscopes.

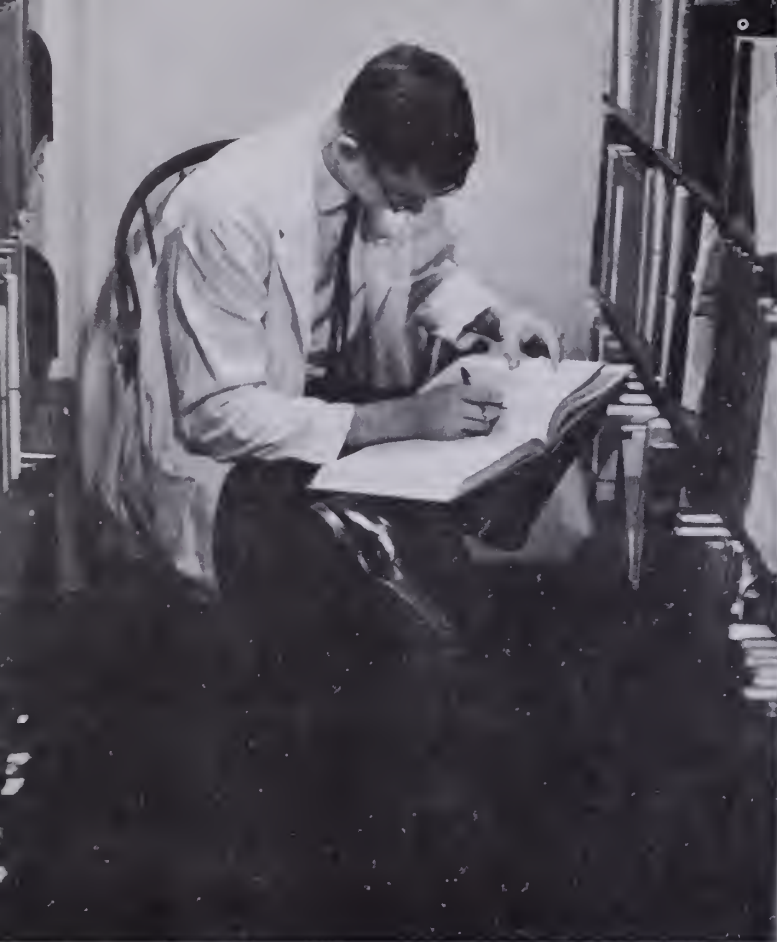
Professor John K. Lattimer is President of the Society for Pediatric Urology, the chairman of the

American Urological Association's Committee for Pediatric Urology, and Chairman of the American Academy of Pediatrics' Committee for Pediatric Urology. He is also a member of the Advisory Committee for Urology of the American College of Surgeons, the Advisory Committee for Genitourinary Surgery of the New York Academy of Medicine, and the Committee on Plans of the Veterans Administration and Armed Forces Cooperative Study of Methods for the Therapy of Tuberculosis.

Among the major donors to the Department of Urology during the year 1961 were:

The American Cancer Society, Mr. Alex Ardrey, Mr. Vincent Bergantino, the Bjorksten Research Foundation, the Brooke Foundation, Charles H. Brower, Ed Lee and Jean Campe Foundation, Mr.

H. Donald Campbell, the Commercial Solvents Corp., Mr. Dadour Dadourian, Mr. M. Hartley Dodge, the Herman Goldman Foundation, the Mary W. Harriman Trust, Hoffman La-Roche, Inc., Mr. William F. Hirt, Lakeside Laboratories, Inc., Dr. and Mrs. John K. Lattimer, Robert A. Lovett, Mr. James P. Mills, Mr. Morris Morgenstern, the Rev. Ewald H. Mueller, New Jersey Heart Association, New York Tuberculosis and Health Association, Ocean Spray Cranberries, Inc., Mr. Charles J. Oppenheim, Jr., Charles Pfizer and Company, the G. D. Searle Company, the Sterling Winthrop Research Institute, Mr. Sidney Schiff, the United States Public Health Service, Mrs. Stephan VanBoythan, Warner Lambert, and Winthrop Laboratories.



Medical Library

THOMAS P. FLEMING

Professor of Library Service

The Medical Library of Columbia University, although not the largest Medical Library in the United States, is noted for the excellence of its literature resources, the services it provides, and the use made of these resources and services by the clientele which it serves.

Its principal function is to provide library service to the Columbia-Presbyterian Medical Center, a community of some 7,000 individuals. It also provides medical library service to the Columbia University Corporation and its affiliated institutions.

The present collection numbers some 250,000 bound volumes of which more than 150,000 are serials. The library currently receives more than 3,500 periodicals. The principal journals of the world are represented in the collection including those in the Russian and Japanese languages. The library draws freely upon the other Columbia libraries for desired materials which are not present here. It also procures from other libraries, such as the National Library of Medicine in Washington, materials which Columbia does not possess.

The use of our library continues to rise. During

this year a total of 270,000 volumes were used, representing a four per cent increase over 1960. Our resources are often made available for use, via inter-library loan, in other libraries including those in foreign countries, such as Czechoslovakia. More than 1,300 items were loaned to other libraries during the year.

An outstanding feature of the library is the Bibliographic Service, which supplies references to the literature on topics currently under investigation. More than 13,000 references were supplied this year, representing a ten per cent increase over last year's figure. We are presently searching the literature for thirty-one subjects requested by nineteen scientists from twelve departments.

Orientation tours and lectures on the use of the literature were again given to the entering classes. The teaching function of the library is an important one and continues to grow each year. The formal lectures and tours are over and above those given by our staff on an individual basis to new interns and residents.

The library provided "in service" training for li-

brarians from Vietnam and Norway. It also served as a laboratory for some thirty librarians taking the special courses in medical librarianship given by the Librarian under the auspices of the School of Library Service. The Philippines, Burma, Canada, Ghana, and New Guinea were represented.

The Medical Library each year plays host to visiting librarians from all over the world. This year librarians from Switzerland, Yugoslavia, Sweden, Norway, Chile, and Argentina visited us in order to observe our services and examine our resources.

There were several personnel changes this year. Samuel J. Waddell resigned on September first to accept a position in the Library of the College of the City of New York. Sophie Gerlach, a recent graduate of Columbia's School of Library Service, was appointed as a Reference Assistant. Brenda Crudge, who was appointed last year as Cataloger, now divides her time between reference and cataloging. The position of Supervisor, Cataloging Department, has not as yet been filled.

The library is ever grateful to its clientele, alumni and friends for their generous gifts. During this year we received more than 35,000 items. It is impossible to name all our donors, but we extend our thanks to them all. The Josiah Macy, Jr. Foundation, the Arthritis and Rheumatism Foundation, Chas. Pfizer and Company, the Mount Sinai Hospital Library, Dr. Beatrice Kesten and Mrs. F. P. Browning, Jr. were of particular help to us in building up our collections. These gifts enable the library to have duplicate copies of material, which results in a more generous lending policy.

Additional donations were received this year for the Dr. Frank P. Shepard, Jr. Gift Fund, which was established last year. Dr. Jerome P. Webster continued his past generosity in support of the collection of plastic surgery. Dr. William Vogler of Bronxville, New York, a retired cardiologist, placed on deposit with the Medical Library a collection of extremely valuable Medical Portraits (246 items). The collection outlines the history of medicine through portraits of some of the great figures in medicine since Hippocrates and includes an unequalled set of photographs, lithographs and etchings of doctors who have been concerned with the treatment of heart disease over the past 2,500 years. The portrait collection will be used for instruction and as a rotating exhibit in the conference room dedicated to Dr. Hugh Auchincloss, Sr. in the new Medical Library. Dr. Vogler has pledged a contribution to the Columbia-Presbyterian Medical Center Development Program for the installation of this conference room.

The library's assistance was acknowledged by Dr. W. A. Silverman in his book *Durham's Premature Infants*, N. Y., Hoeber, 1961; by Drs. E. A. Kabat and N. M. Mayer in their book *Experimental Immunochemistry*, Springfield, Thomas, 1961, and by Dr. David Wolf in an article in the *Bulletin of the History of Medicine*, v. 25, pp. 193-220 for May-June, 1961, "Sydenham and Locke on the Limits of Anatomy."

Institute of Comparative Medicine

CHARLES A. SLANETZ, *Curator of Animal Husbandry*

Studies were carried out during the past year on the nutrition of laboratory animals, the disease control in mice, rats and rabbits, on fats and their fractions as related to protective properties, and on salt intake and rat behavior.

Two superior laboratory animal diets were formulated and tested in collaboration with Cornell University and the Cooperative GLF Exchange. One pelleted diet is for mice and rats, the other for dogs. Additional studies are in progress to determine whether five percent, seven percent or eleven percent fat is preferable in mouse and rat stock diets for reproduction purposes.

New techniques and procedures were developed to help in the control of Salmonellosis and Oxyurid infestation of mice and rats. Work on coccidiosis is being done in cooperation with the American Breeders Association.

The value of fats, animal and vegetable, in guinea pig diets is being studied with Dr. Henry S. Simms, Assistant Professor of Biochemistry (Pathology), collaborating. Studies with autoxidized fats and their fractions were continued. Various fresh fats were examined for their capacity to protect rats against the deleterious effects of rancid fat included in the diet, and it was concluded that there is a correlation between the melting point of a fat and its protective properties; liquid fats were more protective than solid fats regardless of the degree of unsaturation.

A highly polymerized fraction of autoxidized methyl linolenate is being fed to rats in a life time study. It has been used in an experiment testing the effectiveness of various fats in lessening x-irradiation damage. Studies of its influence on body lipid composition have also been carried out.

Another series of experiments have dealt with the influence of fatty acid chain length on linoleic acid requirements and on the lipid composition of serum and liver and depot fats. It could be shown that linoleic acid requirements of the rat were higher when the diet contained the saturated triglycerides of long-chain fatty acids than when medium-chain, saturated triglycerides were fed. Serum lipids were also affected by the type of triglycerides fed; i.e., the rats given the long-chain fat had higher levels of sterate in their serum than did the others. This may be important for the problem of clotting.

Investigations have been carried out on the effect of higher salt intakes on the consummatory behavior of the rat. When rats given a choice of water and a one percent salt solution to drink, and showing a preference for the latter, were partially deprived of food, they markedly increased their already appreciable intake of the salt solution. Their water intake did not change, nor did that of their water drinking controls. On autopsy, the weights of the kidneys and hearts were heavier in the group given access to salt.

Reports of Women's Auxiliaries

The Presbyterian Hospital in the City of New York

Board of Women Managers of the Babies Hospital

MRS. JOHN S. TILNEY, *President*

1961 has been a busy and active year for our Board Members. Foremost in the thoughts of everyone has been the participation in the Drive for the Development Program of the Medical Center. Mrs. B. Rionda Braga has served as Chairman of the drive and Mrs. Neville J. Booker as Honorary Chairman. Co-Chairmen for Babies Hospital are Mrs. Henry C. Taylor and Mrs. Carll Tucker Jr. Team Captains are Mrs. K. Herluf Trudso, Mrs. Charles M. Post Jr., Mrs. Lewis B. Harder, Mrs. Fred L. Heyes, Mrs. Arthur H. Christy and Mrs. William E. Hill.

In February, a joint meeting was held with the auxiliary members of the Orthopedic Hospital in the Board Room of Babies Hospital. This was an orientation meeting for members and the friends they had asked to help with this drive. It was a most successful meeting addressed by General Lucius D. Clay and Dr. Frank E. Stinchfield.

On December 5th, a tea and tour of the Medical Center was given in the Board Room of Babies Hospital in honor of those who are not members of our committee, but who are working for the drive.

We are most pleased to report that to date we have raised \$220,457.00 of our goal of \$224,000.00.

Our budget for this year was \$21,204.00. This represented support for the care of Ward and Clinic Patients, Emergency Nursing Fund, Recreational Therapy, Pediatric Psychiatric Clinic, Volunteer Department, and Christmas dolls and toys. In addition to this budget, \$435.00 was given to the Emergency Nursing Fund by individual members.

The Board is grateful for the many gifts and contributions received during the year from:

American Express Company (Glee Club); American Red Cross; Mr. Nathaniel R. Bronson, 3rd; Mr. James Campbell; Chase Manhattan Bank (American Legion Post); Fort George Presbyterian Church; Fort Washington Presbyterian Church; Hendrick Hudson Memorial V.F.W. — Ladies Auxiliary #3300; Mrs. Charles V. Hickox; Holy Rood Church; Lions Club of Upper Manhattan; Mr. Edgar A. Newberry; New York Telephone Company (Doll and Toy Committee); Mrs. Charles Morgan Post, Jr.; Mr. Jeffrey Rogovin; Mr. Mickey Rooney; Mr. and Mrs. R. Peter Rose; School of Dental and Oral Surgery of College of Physicians and Surgeons; Seraphic Secretaries of America; Mr. L. L. Stanton; WMCA Radio Station; WOR Children's Christmas Fund; X-Ray

Department of Presbyterian Hospital (3rd floor aides and technicians); and Mr. Fred Zimmerman.

Mrs. R. Peter Rose served again as Chairman of the Recreational Therapy Department. Both the Board and Miss Ruth Vickers are most appreciative of all she has done for this department. Miss Vickers and her assistant, Mrs. Gerald Murphy, have continued to conduct a wonderful program for the children.

Mrs. Fred L. Heyes served again as Chairman of the House Committee. General maintenance and replacement of furniture was carried out in many areas, including the Board Room. Mrs. Heyes is to be commended for her fine work.

The volunteer program was a most active one throughout the year. Mrs. Thomas V. Santulli and Mrs. Munn Baker were our Chairmen. The Board is most grateful to Miss Laura Vossler, Director of Volunteers, for her splendid cooperation in making the volunteer program a success throughout the Hospital. The Volunteer Tea was attended by members of the Board.

Mrs. Charles M. Post Jr. has been most active and helpful as Chairman of the Nursing Committee. Miss Marjorie Peto's work as Director of Nursing for Babies Hospital has been outstanding. Our Board is well aware and most appreciative of the work that is carried on under her direction.

The Emergency Nursing Fund has helped 52 patients throughout the year at the cost of \$4,502.76. Generous contributions to the Fund were made by the following: Mrs. Frederic F. deRham, Miss Ethel Donaghue, Memorial gifts from members of Crib-side Social Service Committee.

Guest Speakers who addressed our Board meetings this year were most interesting and brought us close to the work that is being done at the Hospital. Our guest speakers were Miss Laura Vossler, Dr. Marguerite J. Gates and Dr. Robert W. Winters. Each month two members of the Board visited the Hospital and reported their findings at the following meeting. In addition a tour of the Medical Center was given by Mrs. Marguerite Stein to members of the Board attending a Luncheon after our November meeting.

The Auxiliary luncheons were attended each month by members of the Board. We all feel that these meetings with Mr. Binkert are most important as well as interesting.

Mrs. John S. Tilney served again this year as Chairman of the Womens Division of Manhattan and the Bronx of the United Hospital Fund. Mrs. Arthur H. Christy served as Vice-Chairman of Hospital Week for the United Hospital Fund.

Mrs. Richard Migel, Group Leader for Babies Hospital for the United Hospital Fund, is to be congratulated for her fine work. Her Team Captains also did a fine job this year. They are Mrs. Bradley I. Collins, Mrs. Grover O'Neill, Jr., Miss Dorothy Mills and Miss Hope Kingsley. To date, Babies Hospital reports a total of 426 gifts for \$33,474.87.

Mrs. Thomas V. Santulli, Chairman of Box Week for Babies, has done a fine job. The receipts to date are \$271.04, with boxes still to be counted.

I would like to thank the members of our Board who have demonstrated on every occasion their loyalty to Babies Hospital and have shown by their support and interest a wonderful spirit. I am most

grateful for their help and judgment on the various projects that we have undertaken. I would like, also, to thank the Administration of the Medical Center for their help to our Board. They are always ready and willing to discuss any problems we may have. Mr. Binkert, especially, has created the finest possible relationship between the Administration and the Women's Boards. Every effort is made to keep us informed of what is being done throughout the Medical Center. This spirit of cooperation and interest is ideal.

To Dr. Edward C. Curnen Jr. and the Department Heads I give my thanks and appreciation, as do all the members of this Board.

And finally I would like to thank Miss Elizabeth R. Callahan, Unit Manager of Babies Hospital. I cannot say how much she means to Babies Hospital and to the Board. We are most grateful and appreciative of all she does for us.

Cribside Social Service Committee

MRS. LEO C. FENNELLY, *Chairman*

It has been several years since the Cribside Committee and the Board of Women Managers began working together, and to the Cribside Committee certainly, this has been an inspiring experience. For example, the Bargain Box which is a Cribside undertaking, is being most generously supported by the Board of Women Managers. Through the tireless efforts of the Chairman of the Bargain Box, Mrs. Herman Hoops, the net receipts this year were \$7,690.47.

In trying to raise money for the Building Fund, Mrs. Herluf Trudso is working with members of the Board of Women Managers and has been most successful in her efforts. The Lenten Sewing class was held at the homes of Mrs. Neville J. Booker and Mrs. Ward Melville, and a short address by two staff members, Miss Adelaide Vrooman and Miss Deborah Farber was an interesting addition. Besides the garments that were made, the net receipts were \$317.

The use of the Cribside endowed beds has been of immeasurable help to a number of families whose children have required hospital admission.

During the summer, 80 children were sent to camp. Many of these children were physically handicapped youngsters who needed and benefited from the rehabilitation combined with out-of-door living. Parents of these children contributed \$545

to the total cost of \$1,967.

In November of this year, a donation of \$300 was credited to the Cribside funds, a grant made by the Havens Relief Fund Society to be used for the temporary assistance of patients or families known to Babies Hospital Social Service. In December, a gift of \$200 was made to the Committee by The Theodore Schulze Foundation, a foundation which has contributed previously to our funds.

We are also glad to report that Miss Ethel Donaghue contributed \$200 to the Emergency Nursing Fund.

In July, as recorded in the December issue of the "Stethoscope," the Committee financed the cost of a physician's fare to Denver and return. He accompanied a 19-month-old toddler to a Denver hospital which, because of climatic conditions, could offer more hope to this child who was suffering with acute asthma. In June, due to unusual circumstances, transportation costs of \$170 were paid for a child requiring cardiac surgery.

Despite the great benefits of working in a teaching center with an educational program for student social workers and seminars for in-service training, staff shortages in Social Service continue to exist. With this in mind, and although the Cribside Committee did not offer a Scholarship during the past year, it looks forward to resuming this responsibility.

The Mary Harkness Auxiliary

MRS. EDWARD M. WHEELER, *Chairman*

The Mary Harkness Auxiliary has enjoyed another year of close association with the Unit, helping, whenever possible, in the fine work that is done to provide another step in the continuation of the medical care program of the Presbyterian Hospital.

We have been proud of the excellent standards Miss Miriam Hubbard, R.N., has maintained at Mary Harkness, and we have been grateful for her loyal dedication to her duties. Dr. John T. Beaty and Dr. Robert C. Darling have continued their active schedules in providing medical care for the patients; Mrs. Susan Millman, as occupational therapist, and Mr. Mark Glatzer, as physical therapist, have contributed tremendously to the welfare of the patients; Mrs. Jean Carey has been invaluable as the Unit secretary.

The Auxiliary held its five stated meetings in 1961. Dean Aura E. Severinghaus, Mrs. B. Rionda Braga, Mr. R. N. Kerst and Mr. Edward Rieger attended the March meeting, bringing the message of the Development Fund Committee. The May meeting was in the form of a luncheon at the chairman's home.

Some of the year's activities included:

1. The formation of a Foreign Tongues Committee, whereby a file of foreign-language-speaking local neighbors has been formed and is available to Mary Harkness, so that the loneliness of a non-English speaking patient may be alleviated and his convalescence hastened thereby;
2. Supplying of postage for Miss Hubbard's quarterly newsletter, because of the feeling of the value of this friendly communication with the friends of the Home;
3. A contribution to and a deep interest in the rehabilitation kitchen, which was originated this year by Mrs. Millman with extreme benefit to many of the patients at the Home;
4. Bringing the Library up to date, and rearranging it to a more useable form;

5. A Christmas party for the patients on the evening of December 18th, when the Westminster Choir of the Rye Presbyterian Church provided musical entertainment. Refreshments were served among the marvelous decorations put in place by Stanley Muzoleski;
6. The provision of Christmas gifts for patients and staff on Christmas morning;
7. The introduction of two volunteers who did eighty-two hours of service in the occupational therapy department during the summer;
8. Work on the Development Fund.

It is indeed the loss of the Auxiliary that Mrs. Dudley B. Donald has had to resign, after several years of faithful service.

Mary Harkness Unit has had an exciting year of physical improvements: there has been much painting by Stanley Muzoleski; there are new rugs on the first floor, an iron railing at the front door, gates at the top of two stairwells; a stainless steel refrigerator has been installed, as has an ice machine and a new dishwasher; the kitchen has new tile flooring; a new Buick station wagon has been provided; a shuffleboard court has been added to the recreation facilities.

Miss Hubbard now sells in the "Country Store" notepaper with a lovely drawing of Mary Harkness Unit.

We are grateful to all the neighbors, local organizations and companies who have provided entertainment for the patients from time to time.

We have been pleased that many have been able to visit Mary Harkness this year, especially individuals and groups from Presbyterian Hospital. A cordial welcome is extended at all times.

We feel that Miss Hubbard and her staff have successfully provided in the Home a most helpful period of convalescence for the patients. This post-hospital period builds the bridge back to adjustment to normal living.

Neurological Institute Auxiliary

MRS. SIDNEY J. WEINBERG, *Chairman*

The Auxiliary of Neurological Institute is pleased to report that 1961 has been a year of considerable activity in Auxiliary service.

Since its inception our Auxiliary has given its utmost support and directed its greatest efforts to our Social Service Department. We regret that due to vacancies in the staff, we can now take care of only the urgent cases. Our problems are city wide and country wide — salaries and housing. But with the untiring efforts of Miss Elizabeth Pritchard and Miss Esther Shaw and work beyond the call of duty from our loyal staff, we can still report an excellent record.

The Auxiliary voted in the Spring to give a \$2,500 scholarship through the New York School of Social Work of Columbia University. This was won by Miss Joan Barenkopf — an interested and effective worker. We hope to give other scholarships in the future.

We again supplied funds to patients who were unable to pay for Private Nursing Care. This was done under the careful supervision of Miss Catherine F. Gallagher.

We financially supported the requests from the Library and from the Volunteer Department and were able to allocate a substantial increase to our Summer Camp Campaign Fund. Miss Marion Holland capably handles the ever growing needs of this Department.

Mrs. J. Lawrence Pool and Mrs. Bruce Brodie continue their efforts for the Medical Center Development Fund Campaign. Most of the members of our Auxiliary have sent in their personal contributions.

We have had a banner year from our Thrift Shop due to the diligent work of Mrs. Royall S. Cannaday

and her committee who deserve our sincere gratitude.

Mrs. Donald K. David reports that the Art Cart program has been taken over by the Junior League, who started it. The Auxiliary continues to supply them with prints and to visit the wards from time to time with the League girls. We are again grateful to United Hospital Fund for some pictures to be hung in the new X-ray waiting rooms.

At the Spring luncheon we had the pleasure of a talk by Dr. H. Houston Merritt. On that occasion, members of the Auxiliary met Miss Elizabeth S. Gill, who succeeded Miss Eleanor Lee as Director of Nursing, and Dr. Carl R. Wise, successor to Dr. James E. McCormack as Assistant Vice President. Since then, Dr. Wise has advised and helped us in many ways and we have enjoyed working with him.

This year Mrs. Charles E. Adams joined the 25 Year Club. We were delighted that she and Miss Gallagher were inducted at the same time.

A group of our members attended the tea given in honor of Miss Helen Coxhead of the Public Interest Department. We regretted her retirement after so many years of happy cooperation.

We have welcomed four new active members to the Auxiliary — Mrs. Roger Blough, Mrs. Alanson B. Houghton, II, Mrs. John L. Weinberg and Mrs. Sidney J. Weinberg, Jr. At Mrs. Edith Achilles' request, she will become an Associate Member in 1962.

Monthly meetings have been well attended during the year and all of the members manifested interest and cooperation in our activities. To all of them — particularly my Vice Chairman, Mrs. Bruce Brodie — and to the Hospital Staff mentioned above, I want to express my sincere thanks and appreciation.

Women's Auxiliary of the New York Orthopedic Hospital

MRS. ROBERT E. CARROLL, *Chairman*

In 1961, as in the past few years, the Auxiliary held its monthly meetings in the Orthopaedic Library on the fifth floor. Attendance has been gratifying and supports the belief that meetings held in the hospital stimulate sympathetic and energetic interest in the activities of the Auxiliary. Frequent reports are made at these meetings by Mrs. Delphine Wolcott, Assistant Director of Nursing, or her assistant, Miss Hester Brown; by Miss Helen Irwin, who directs the Orthopaedic Social Service with her sister, Miss Margaret Irwin; and by our two recreational therapists, Mrs. Eva Hoffman and Mrs. Doris Lagergren. The Auxiliary was honored to have as speakers Mrs. B. Rionda Braga, Chairman of the Women's Committee of the Columbia-Presbyterian Medical Center Development Fund; Miss Helen White, Consultant in Occupational Therapy at the United Hospital Fund, and Dr. Charles Ryder, Associate Professor of Orthopaedic Surgery. The Monday Luncheons, presided over by Mr. A. J. Binkert and Mr. R. N. Kerst, are informative and interesting and our members consider attendance at these meetings a privilege as well as a pleasure.

Expenditures in 1961 amounted to \$26,813.20. \$14,326.00 was spent for the care of ward and clinic patients. The balance provided salaries for two recreational therapists and recreational therapy supplies, partial salary for an Assistant Librarian in the Milbank Library, and salaries for two temporary occupational therapy aides. Also, it supported the Milbank Library, the Volunteer Department, the House Staff Loan Fund, and the Graduate Nurses' Scholarship Fund. Christmas presents were purchased for all hospitalized children as well as many clinic patients, and gifts were given to all non-professional members of the staff. The income for the Auxiliary is derived from money raised for the United Hospital Fund each year and distributed directly to the Hospital in Direct Benefit Payments; from donations from members and friends, and from the income of the Mary E. Secor Trust for use in recreational therapy for children.

Mrs. E. A. Dennison, Secretary of the Auxiliary, represents our hospital auxiliary on the Occupational Therapy Committee of the Women's Activities Division of the United Hospital Fund. In 1961 she

was instrumental in augmenting a recruitment program sponsored by Columbia University and the Office of Vocational Rehabilitation, which gives summer jobs to college students in various hospitals. The United Hospital Fund gave the Auxiliary a \$450 grant and the Auxiliary matched this amount to provide two summer aides for our Occupational Therapy Department. The girls worked during July and August and proved extremely helpful at a time when volunteers are not plentiful and the professional staff takes vacations. The primary purpose of the program is to inform and interest young people in the occupational therapy field. The Auxiliary also distributed occupational therapy recruitment material to vocational guidance officers in schools and to churches, libraries, etc. We will continue to be active in this field as it is one where we can be most fruitful. We are very grateful for the advice and interest of Mrs. Dorothy Weiser, Director of Occupational Therapy, and to Mrs. Dennison for their work in this successful program.

Mrs. Hoffman, recreational therapist for the children, has provided constructive recreation, comfort and pleasure to our many young patients. She has worked many evenings to train volunteers so that the bedtime hours of the children will be contented and happy. Mrs. Lagergren keeps the adults busy with constructive projects, and relaxed with a gay and sympathetic spirit. We are proud of the accomplishments of these two remarkable people.

The Auxiliary has representatives on the Milbank Library Committee, the Volunteer Committee and the House Committee of Presbyterian Hospital. Representatives attend meetings as they are called and report to the Auxiliary at its next meeting. Mrs. James O'Malley, Library Committee representative, reported the need for an assistant librarian early in the year, and we were able to respond with a monthly stipend for partial payment of her salary. Mrs. John Condliffe has worked closely with Miss Laura Vossler, Director of Volunteers, and our volunteer needs are filled and the program running smoothly. The freshly painted Babies floor was accomplished through the efforts of Mrs. Thomas Hitchcock, our representative on the House Committee, who worked closely with Miss Elizabeth

Callahan, Unit Manager of Babies Hospital. Mrs. Hitchcock also supervised the selection and hanging of the pictures in the waiting alcove on the Babies floor.

Mrs. John H. Ewing and Mrs. Reed Gillespie are Co-chairmen for the Development Fund Drive. In February, the Board of Women Managers of the Babies Hospital and the Orthopaedic Auxiliary held a joint meeting. General Lucius D. Clay, Dr. Frank E. Stinchfield, and Mrs. B. Rionda Braga spoke, describing the needs of the Medical Center and opportunities for securing donations.

The Women's Division of the United Hospital Fund again had the honor of being headed by Mrs. John S. Tilney, President of the Board of Women Managers of Babies Hospital. Mrs. Robert E. Carroll served with her again as Chairman of Hospital Teams. Under Mrs. Edward H. Gerry as Group Leader and Mrs. William G. Maguire as Team Captain, that Auxiliary raised \$41,010, and will receive \$14,470 in Direct Benefits. Mrs. William L.

Hutton, our Treasurer, and Mrs. Jarvis Slade were Chairmen of Box Week.

In 1961 the Auxiliary regretfully accepted the resignation of Mrs. John R. Drexel, III, and Mrs. John McGuigan. We have been very pleased to welcome to our membership Mrs. Robert M. Day and Mrs. Jarvis Slade.

In reviewing the achievements of the year, I am conscious of the hours of selfless thought and work of Auxiliary members and the Hospital staff. Our thanks to Mrs. Wolcott and Miss Brown, Miss Helen and Miss Margaret Irwin, Mrs. Hoffman and Mrs. Lagergren cannot be measured. Miss Callahan's interest in our children is evident in the gay new furniture in the play room and waiting area. These hard working and willing people, and the many others with whom we work, are a well of energy and interest for the patients we serve, and my association is a source of tremendous appreciation and pleasure. I look forward to another busy and active year.

Women's Auxiliary of the Presbyterian Hospital

MRS. HAMILTON SOUTHWORTH, *Chairman*

1961 has been an especially full year for the Auxiliary. In addition to our yearly responsibilities we have been asked to raise, in three years, \$120,000 for the Columbia-Presbyterian Medical Center Development Fund. We are fortunate to have three of our members, Mrs. Howard R. Craig, Mrs. Jerome P. Webster and Mrs. Maynard C. Wheeler directing us in this undertaking. \$19,060 has been raised so far.

Meanwhile our members have continued their letter writing for the United Hospital Fund and their work for the Stuyvesant Square Thrift Shop. \$7,200 has been given to the Volunteer Service, \$6,000 to Occupational Therapy, \$8,890 to the Milbank Library, and \$400 to the Kneeland Fund for Social Service.

The United Hospital Fund Committee collected 745 gifts totaling \$50,672, \$16,271 above our goal. Mrs. C. Redington Barrett and Mrs. Ralph H. Boots are again our outstanding workers, as well as our co-chairmen.

The Thrift Shop has had its most successful year since joining the Stuyvesant Square Group. This was due in part to the rehabilitation of the premises, including an air conditioner. Even more important, we have had a faithful year-round staff of volunteers under the chairmanship of Mrs. Lawrence H. Cotter and Mrs. Robert S. Grinnell. This year's net income was \$6,365.

There is no question that the Fall Benefit plays a very large part in securing rummage. Those who had sent in thrift were rewarded with tickets to hear Anne Cox, Fashion Adviser of Bergdorf Goodman, talk at the Cosmopolitan Club on "Fashions for Travel." A Dutch Treat Luncheon was held beforehand. Mrs. Walton P. Kingsley and Mrs. Howard C. Taylor, Jr. were responsible for the success of the Benefit.

Miss Laura Vossler has continued to direct the Volunteers in giving additional services to the Hospital — both to the patients and to the Staff. Training and orientation have been stressed, resulting in many more calls from all departments. Our volunteers perform every kind of service from translation to pushing wheel chairs.

Two Red Cross Nurses Aide courses have been

given with concurrent instruction and practice on the wards; ours being the first hospital to initiate this method. The Red Cross is enthusiastic, and it is gratifying that 50 aides have helped on the Medical and Surgical wards.

We are still handicapped for space but volunteers gave 109,782 hours, the trend seeming to be that the same numbers of volunteers each give fewer hours.

230 volunteers received United Hospital Fund awards, and all our volunteers were honored at the Hospital's annual tea at Maxwell Hall, where 144 received their pins for their first 100 hours service, and 122 were recognized for more than five years of helping the Hospital. Mrs. George A. Perera continues as chairman of the Volunteers and Mrs. Louis Connick as chairman of the Red Cross Nurses Aides.

Mrs. Howard G. Bruenn, the chairman, reports that the Milbank Library was able to solve its most pressing problems of space and extra help. Mrs. Patricia Baker has been appointed as staff assistant to Mrs. Selma Gale. The Women's Lounge, which had been originally furnished by the Auxiliary, was added to the Library. A total of 38,546 books and magazines were circulated and the book stack rose to 7,027 — 885 more books than last year. The addition of many more foreign books was made possible by the receipts from the book sale. Unfortunately the book loss was increased from 191 to 274.

The Occupational Therapy Department has 7 full time therapists under the direction of Mrs. Dorothy Weiser. This year 2,357 patients have been treated by them under doctors' orders. This number does not include the many patients whom the Volunteers have helped with recreational therapy. Mrs. Hilary H. Holmes has been our chairman.

Social Services served approximately the same number of patients in 1961 as in 1960. However, funds expended to meet special needs for patients were greater than in the previous year. Through Mrs. Samuel W. Lambert, Jr. and Mrs. Boots, almoners for the Haven's Relief Society Fund, \$1,400 was used in rehabilitation of individuals and families.

The Educational Program for social work, medical and nursing students continues. 26 students

were from the New York School of Social Work, an increase of six over last year. This additional unit was made possible by a grant from the Office of Vocational Rehabilitation to the New York School. The Kneeland Fund enables staff members to attend courses, conferences and work shops.

Miss Elizabeth R. Prichard, the Director of Social Service, feels there has been an increasing number of patients with emotional problems and an increased need for planning patient care at home. The lack of community resources for the chronically ill and for the newborn needing foster home or adoptive placement continues to be a very serious matter.

Mrs. George H. Humphreys, II has been chairman of Social Service, and Mrs. Carl T. Nelson visitor to the apartment for out-of-town families of children with the diagnosis of retinoblastoma.

It is with sorrow we report the death of Mrs.

Junius H. Browne, one of our members of oldest standing, and, until shortly before her death, an active worker in the Thrift Shop. Four of our members, Mrs. Robert J. Dellenback, Mrs. Wells Drorbaugh, Mrs. Crosby Hornblow and Mrs. Howard C. Moloy have resigned; and four, Mrs. Stuart W. Cosgriff, Mrs. Edward L. Howes, Mrs. Milton R. Porter, and Mrs. Joseph A. C. Wadsworth, have transferred to Associate Membership. Our Active Membership now numbers 61.

Our projects have been generously supported by our members. They have written letters for the Development Fund and for the United Hospital Fund, worked at the Hospital and for the Thrift Shop, and given valuable time to committee meetings. But all our efforts would be of little avail were it not for the support and guidance of the Administration and Staff of the Hospital.

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The Presbyterian Hospital in the City of New York
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Myron S. Roberts, M.D.
Hamid Tarassoly, M.D.
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1961 Publications of Members of the Professional and Academic Staffs

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Appendix

EXHIBIT A

THE PRESBYTERIAN HOSP

Balance

DECEMBER

ASSETS

	<i>December 31</i>	
	<i>1961</i>	<i>1960</i>
CURRENT FUNDS ASSETS:		
Cash	\$ 333,729	\$ 659,767
Investments — Bonds, etc. — at cost (Market value — 1961, \$2,523,021)	2,509,322	1,144,146
Accounts receivable (less reserve — 1961, \$170,082; 1960, \$201,604)	3,679,683	3,401,704
Supplies and materials.....	554,060	458,810
Interest accrued and dividends receivable.....	591,805	573,426
Prepaid insurance, etc.....	91,698	38,791
TOTAL CURRENT FUNDS ASSETS.....	7,760,297	6,276,644
ENDOWMENT AND PLANT FUNDS ASSETS:		
Cash	988,104	19,544
Investments:		
Bonds and stocks — at cost or contributed value (market value — 1961, \$101,453,609)	70,141,240	69,327,769
Saving accounts	660,000	
Mortgages receivable, etc.....	54,484	56,326
Property and equipment — at cost (less accumulated depreciation — 1961, \$12,625,549; 1960, \$12,270,861)	28,428,709	25,046,657
TOTAL	<u>\$108,032,834</u>	<u>\$100,726,940</u>

EXHIBIT A

THE CITY OF NEW YORK

Sheet

1961 AND 1960

FUNDS AND LIABILITIES

	<i>December 31</i>	
	<i>1961</i>	<i>1960</i>
CURRENT FUNDS AND LIABILITIES:		
Accounts payable	\$ 748,568	\$ 672,474
Patients' credit balances	81,163	71,857
Accrued payroll and other expenses	549,913	411,795
Undistributed investment income fund (Exhibit C)	508,821	309,341
Special expendable funds (Exhibit C)	1,943,075	1,750,432
General fund (Exhibit C)	<u>3,928,757</u>	<u>3,060,745</u>
TOTAL CURRENT FUNDS AND LIABILITIES	7,760,297	6,276,644
ENDOWMENT FUNDS (Exhibits C and D)	67,570,711	64,617,456
PLANT FUNDS (Exhibit C):		
Replacement funds	3,514,416	3,880,279
Building funds	758,701	905,904
Capital invested in property and equipment	<u>28,428,709</u>	<u>25,046,657</u>
TOTAL	<u>\$108,032,834</u>	<u>\$100,726,940</u>

EXHIBIT B

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

STATEMENT OF INCOME

For the Years Ended December 31, 1961 and 1960

	<i>Year Ended December 31</i>	
	<i>1961</i>	<i>1960</i>
OPERATING INCOME:		
Care of patients.....	\$20,796,264	\$18,777,283
Other services	1,980,426	1,943,999
TOTAL	22,776,690	20,721,282
Transfer from special expendable funds (Exhibit C):		
For research	501,047	509,850
For other designated purposes.....	658,009	603,951
TOTAL OPERATING INCOME.....	23,935,746	21,835,083
OPERATING EXPENSES:		
Administration	273,043	256,114
Assistant Secretary-Treasurer	212,023	186,633
Comptroller	537,094	497,271
Public Interest	163,941	151,459
Mary Harkness Unit.....	209,596	209,187
Non-professional services:		
Buildings and grounds.....	3,454,984	3,211,050
Food service	2,927,376	2,792,131
Personnel and protective.....	350,840	311,143
Other non-professional services.....	854,839	788,642
Professional services:		
Nursing	7,438,072	6,834,054
Professional staff, doctors' offices and research.....	2,974,567	2,836,232
Special services	4,083,653	3,758,569
Vanderbilt Clinic and other.....	1,956,424	1,842,104
Provision for depreciation.....	1,628,700	1,473,200
TOTAL OPERATING EXPENSES.....	27,065,152	25,147,789
OPERATING LOSS	3,129,406	3,312,706
OTHER INCOME FOR GENERAL PURPOSES:		
Investment income	2,860,000	2,680,000
Contributions	647,074	569,304
TOTAL OTHER INCOME FOR GENERAL PURPOSES.....	3,507,074	3,249,304
EXCESS OF INCOME (EXPENSES) (transferred to general fund — Exhibit C)	\$ 377,668	\$ (63,402)

EXHIBIT C

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1961 and 1960

	<i>Year Ended December 31</i>	
	<i>1961</i>	<i>1960</i>
GENERAL FUND		
Balance, January 1.....	\$ 3,060,745	\$ 2,495,819
Add:		
Unrestricted legacies	240,297	1,324,744
Gain from investments sold or redeemed.....		1,469
Associated Hospital Service of New York rate adjustment for prior year (excluding amount added to replacement funds).....	537,070*	376,966
Excess of income (expenses) (Exhibit B).....	377,668	(63,402)
	<u>1,155,035</u>	<u>1,639,777</u>
Total	4,215,780	4,135,596
Deduct — Expenditures for property and equipment.....	287,023	1,074,851
Balance, December 31.....	<u>\$ 3,928,757</u>	<u>\$ 3,060,745</u>
* Rate adjustment for current year, not presently determinable, will be included in income when received.		
SPECIAL EXPENDABLE FUNDS		
Balance, January 1.....	\$ 1,750,432	\$ 1,732,947
Add:		
Legacies and contributions.....	1,034,683	1,041,009
Investment income	463,351	433,392
Other income	294,386	257,860
	<u>1,792,420</u>	<u>1,732,261</u>
Total	3,542,852	3,465,208
Deduct:		
Transfers to:		
Operating income (Exhibit B).....	1,159,056	1,113,801
Endowment funds	208,912	33,765
Building funds		298,919
Expenditures for property and equipment.....	88,880	115,575
Miscellaneous	142,929	152,716
	<u>1,599,777</u>	<u>1,714,776</u>
Balance, December 31.....	<u>\$ 1,943,075</u>	<u>\$ 1,750,432</u>
UNDISTRIBUTED INVESTMENT INCOME FUND		
Balance, January 1.....	\$ 309,341	\$ 141,018
Add:		
Income Earned:		
Investment portfolio	3,590,717	3,400,885
Income from trusts and undistributed estates.....	103,438	64,145
	<u>3,694,155</u>	<u>3,465,030</u>
Total	4,003,496	3,606,048
Deduct:		
Transfers to:		
General purposes	2,860,000	2,680,000
Special expendable funds.....	463,351	433,392
Replacement funds	149,567	159,809
Building funds	21,757	23,506
	<u>3,494,675</u>	<u>3,296,707</u>
Balance, December 31.....	<u>\$ 508,821</u>	<u>\$ 309,341</u>

EXHIBIT C (Continued)

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1961 and 1960

	Year Ended December 31	
	1961	1960
ENDOWMENT FUNDS		
Balance, January 1.....	\$55,838,103	\$54,468,655
Add:		
Legacies and contributions.....	1,572,198	1,335,683
Transfers from special expendable funds.....	208,912	33,765
	<u>1,781,110</u>	<u>1,369,448</u>
Balance, December 31.....	57,619,213	55,838,103
Portion of accumulated gain from pooled investments sold.....	9,951,498	8,779,353
Total.....	<u>\$67,570,711</u>	<u>\$64,617,456</u>
PLANT FUNDS		
REPLACEMENT FUNDS:		
Balance, January 1.....	\$ 3,655,388	\$ 4,209,425
Add:		
Funding of provision for depreciation.....	1,628,700	1,473,200
Investment income.....	149,567	159,809
Reimbursement from Associated Hospital Service of New York for extraordinary repairs and maintenance.....	207,957	
	<u>1,986,224</u>	<u>1,633,009</u>
Total.....	5,641,612	5,842,434
Deduct — Replacements and rearrangements.....	2,403,986	2,187,046
Balance, December 31.....	3,237,626	3,655,388
Portion of accumulated gain from pooled investments sold.....	276,790	224,891
Total.....	<u>\$ 3,514,416</u>	<u>\$ 3,880,279</u>
BUILDING FUNDS:		
Balance, January 1.....	\$ 905,904	
Add:		
Contributions.....	1,153,703	\$ 740,491
Investment income.....	21,757	23,506
Distribution from Columbia-Presbyterian Medical Center Fund, Inc. for construction purposes.....	908,200	
Transfers from special expendable funds.....		298,919
	<u>2,083,660</u>	<u>1,062,916</u>
Total.....	2,989,564	1,062,916
Deduct — Expenditures for property and equipment.....	2,230,863	157,012
Balance, December 31.....	<u>\$ 758,701</u>	<u>\$ 905,904</u>
CAPITAL INVESTED IN PROPERTY AND EQUIPMENT:		
Balance, January 1.....	\$25,046,657	\$22,985,373
Add:		
Transfers from:		
General fund.....	287,023	1,074,851
Special expendable funds.....	88,880	115,575
Building funds.....	2,230,863	157,012
Net change in accumulated depreciation (excess of replacements and rearrangements over provision).....	775,286	713,846
	<u>3,382,052</u>	<u>2,061,284</u>
Balance, December 31.....	<u>\$28,428,709</u>	<u>\$25,046,657</u>

EXHIBIT D

THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK

ENDOWMENT FUNDS

December 31, 1961

THE PRESBYTERIAN HOSPITAL:

Anonymous	\$ 685,926	Harkness, Edward S., Research.....	500,000
Anonymous — For Support of Residency Training	270,500	Harkness, Mary Stillman, Memorial Endowment	250,000
Arnstein, Daniel G.....	183,962	Harkness, Mary Stillman, Memorial Research	50,000
Baker, Frances E.....	11,058	Harkness, The Mary S., for Convalescent Care	1,003,045
Baker, Mrs. Frederick, Pathological Department	8,500	Harkness, William Hale, Memorial... ..	43,416
Bertrand, Ellen Clark, Memorial.....	10,000	Hartford, The John A. Foundation... ..	300,000
Briddon, C. K., Gold Medal.....	2,559	Hill, Marguerite S.....	5,500
Brookman, Henry D.....	50,000	Honic, Louis M.....	21,557
Carle, Robert W. and Adele S., Endowed Room	50,000	Ingenthron, May A., Memorial Bed... ..	26,227
Cary, Caroline Catherine.....	50,000	Institute of Ophthalmology, The....	3,412,942
Coakley, Cornelius G.....	665,445	Jesup, Morris K. and Maria DeWitt.. ..	100,000
Coakley, Cornelius G., Memorial.....	30,000	Johnston, Andrew, Memorial Room.. ..	50,929
Colgate, Hannah, Memorial.....	60,794	Jones, David, Memorial.....	300,000
Collins, Perry McDonough.....	548,999	Jones, Margarette A.....	166,255
Columbia University for Vanderbilt Clinic and Sloane Hospital.....	1,400,000	Keller Memorial	500
Cook, William W.....	139,806	Kennedy, John Stewart.....	1,828,714
Cooper, Charles P. and Leonora P....	45,363	Kinnicutt, The G. Herman, Flower... ..	5,000
Cragin Fund	68,819	Knapp, The Herman Memorial Eye Hospital Endowed Bed.....	60,375
Davis, Isabel G.....	813,999	Krumb, Henry	25,000
Delano, Moreau	4,000	Lattimer, Dr. John K.....	64,085
Department of Surgery Research.....	30,034	Lindley, Erasmus C.....	50,000
Dodge, The Cleveland H.....	310,500	MacMillin, Isabel, Memorial.....	1,409,359
Dortic Memorial	99,024	Maloy, The Frank and Selena, Memorial	25,000
Dows, Mrs. David.....	7,700	Martin, Frederick Townsend.....	10,000
Dows, Margaret E.....	5,360	Maxwell, Anna C., Memorial Library	7,401
Educational and Scientific Work.....	285,528	McCosh, Dr. Andrew J., Memorial... ..	100,192
Eichner, Joseph Herman and Hannah, in Memory of.....	8,576	McCready, Jeanne Campbell.....	106,529
Eidlitz, Otto M.....	415,272	McGuire, Mary Madison.....	260,006
Eidlitz, Robert J.....	214,901	Medical Center Development Program	4,105
Endowed Bed	1,925,200	Medical Laboratory Development Endowment	150,000
Endowed Bed — Research	190,003	Medical Scientific	317,226
Faulkner, The Edward Daniels, Memorial for the Study and Treatment of Arthritis	100,000	Milbank, Dunlevy	1,000,000
Fiske Fund	104,236	Miller, James, Endowed Room.....	75,311
FitzGerald, Frederick H. and Josephine F.	141,363	Miller, Margaret G.....	60,275
Flagler, Alice Manderlick.....	250,142	Moore, Paul, Research.....	50,000
Foote, Edwin Bancroft.....	175,949	Nathan, Garfield Arthur.....	258,981
Ford, George W. and Eliza Lawson.. ..	330,911	O'Connor, Fenwick	7,020
Fracture Endowment Fund.....	10,000	Ottman, for Cancer Research.....	20,000
Fremstad, Anna Olivia.....	56,275	Parkin, Alice Temple.....	50,000
General Endowment	1,412,700	Physical Medicine and Rehabilitation Service Endowment	100
Goldschmidt, Henry Philip.....	5,000	Prostate, Fund for Research.....	2,181
Gondran, Sophie M. and Adolph L... ..	100,000	Quick, The Walter R.....	15,060
Griffith, Griffith W. and Mary Jones, Memorial	1,331,292	Research and Development in Anesthesiology	90,500
Haller, Maria L.....	2,609	Research and Development in Department of Medicine.....	47,250
Harkness, Edward S.....	6,188,794	Rogers, Henry H., Memorial.....	30,294
Harkness, Edward S., Memorial.....	14,000,000	Sage, Dean, Memorial.....	28,253
		Sage, Dean, Scholarship.....	7,000

ENDOWMENT FUNDS — *Continued*

Sage, Russell and Margaret Olivia, Memorial	878,188	Harkness, Edward S., Educational and Scientific	600,000
School of Nursing	205,730	Harkness, Edward S.	1,199,775
Secor, Mary E.	42,063	Harkness, Mary Stillman, Memorial Endowment	250,000
Sherry, The Bertha, Memorial	653,401	Kimball, Reuel B.	57,738
Sidman Trust	1,072	Lambert, Dr. Charles I., Memorial ...	10,000
Sloane Hospital	783,257	McIntosh, Dr. Rustin	23,818
Sloane Hospital Babies' Alumni	20,297	Pratt, Samuel	35,161
Sloane Hospital Research	25,000	Rathbone, R. Bleecker	15,000
Squier Clinic	113,636	Rumson Fund	20,470
Stein, Jules	25,000	Videre, Leontine, Foundation	9,976
Stilson, Ellen J. and Minnie	21,029	Wilcox, Herbert B., Memorial	2,000
Stone, William Ridgley, Memorial ...	81,033		<hr/> 2,302,101
Surgical Fellowship	60,000		
Terry, John T., in Memory of	40,767		
Tod, J. Kennedy, Memorial	100,102	NEUROLOGICAL INSTITUTE:	
Tolfree, The Caroline O. and James E., Memorial	157,370	Blair Memorial	3,127
Urological Service Research	23,253	Endowed Bed — Research	166,049
Valentine, Isaac E., Memorial	563,227	Ogilvie, Clinton, Memorial	9,970
Van Norden, Kathryn L.	2,609		<hr/> 179,146
Vanderbilt Clinic	156,806		
Webster, Dr. Jerome P., Library of Plastic Surgery	30,861	NEW YORK ORTHOPEDIC HOSPITAL:	
Weinberg, Ruth F.	130,000	Bridgman, Statira	2,500
Weinberg, The Sidney J., Employees Educational Aid	70,000	Endowed Bed	623,343
Weinman, Moses	5,360	Farrell, Dr. Benjamin P., in Memory of	7,656
Weisl, Alice	130,125	General Endowment	833,259
Welles, Frances Swan	10,000	Hibbs, Russell A., Memorial Library.	36,068
Westlake, Emory H. and Caroline B. ...	27,392	Hurst, The Thomas D. and Kate	5,000
Wheeler, The Dr. John M., Memorial	73,791	Kane, Annie C., Fellowship	1,000,000
Williams, William	342,658	Orthopedic Surgery Endowment	80,000
	<hr/> 49,970,714	Rathbone, R. Bleecker	15,000
		Smith, Dr. Alan DeForest, Lectureship	6,601
		Tower, Mary T., in Memory of	30,569
		Watson, Emily A.	2,502,256
		White, Emily Vanderbilt	20,000
		Willard, Mary Livingston	5,000
			<hr/> 5,167,252
THE BABIES HOSPITAL:		TOTAL ENDOWMENT FUNDS	57,619,213
Cleft Palate Cases	8,333		
Cribside Social Service Committee ...	12,828	PORTION OF ACCUMULATED GAIN FROM POOLED INVESTMENTS SOLD	9,951,498
Educational Therapy	1,000		<hr/> \$67,570,711
Eichner, Joseph Herman and Hannah, in Memory of	8,576		
Endowed Bed	37,426		
General Endowment	10,000		

ACCOUNTANT'S OPINION

THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

We have examined the balance sheet and supporting schedule of endowment funds of The Presbyterian Hospital in the City of New York as of December 31, 1961 and the related statement of income and summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying balance sheet (and schedule of endowment funds) and statement of income and summary of fund changes present fairly the financial position of the Hospital at December 31, 1961 and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HASKINS & SELLS
Certified Public Accountants

New York

February 6, 1962

REPORT OF THE AUDITING COMMITTEE

TO THE BOARD OF TRUSTEES OF THE PRESBYTERIAN HOSPITAL
IN THE CITY OF NEW YORK:

Pursuant to Article VII of the By-Laws of The Presbyterian Hospital in the City of New York, the undersigned Auditing Committee appointed by your Board has chosen, with your approval, the firm of Haskins & Sells, as independent certified public accountants, to make an examination of the books and accounts of The Presbyterian Hospital in the City of New York for the fiscal year 1961.

We submit herewith after due consideration by this Committee, an opinion of Messrs. Haskins & Sells dated February 6, 1962 relating to the Corporation's balance sheet and schedule of endowment funds as of December 31, 1961 and related statement of income and summary of fund changes for the year then ended, as the results of a satisfactory examination of the said books and accounts. Your Committee recommends that the opinion and financial statements be accepted and approved.

JOHN A. GIFFORD, *Chairman*
JOHN S. BURKE, JR.
DORRANCE SEXTON
Auditing Committee

New York

February 7, 1962

EXHIBIT E

**GROUP RETIREMENT PLAN ESTABLISHED BY
THE PRESBYTERIAN HOSPITAL IN THE CITY OF NEW YORK**

The retirement benefits provided by the Hospital under its Group Retirement Plan are partly provided by a Trust Fund established with the Morgan Guaranty Trust Company of New York and partly insured by the Travelers Insurance Company. The amounts set aside for retirement benefit purposes, which are not part of the assets of the Hospital, aggregated \$6,474,342 at December 31, 1961. In accordance with the Hospital's undertaking under the Group Retirement Plan the amounts already set aside are sufficient to provide for all retirement benefits to which employees now retired and employees now eligible to retire at their own request are or would upon retirement be entitled under the Plan. In addition, they include provision for that portion of future retirement benefits to employees not now eligible for retirement at their own request, which has been funded through December 31, 1961 under the systematic program followed by the Hospital in financing such benefits.

Following is the Trustee's report for the year ended December 31, 1961 of the Retirement Fund Trust established by the Hospital:

Assets in Fund — January 1, 1961	\$2,401,945
Payments to Fund	169,640
Net Income from Investments including Net Profit on Investments Disposed of	112,234
	<u>2,683,819</u>
Disbursements for Retirement Benefits	86,413
Assets in Fund — December 31, 1961	<u>\$2,597,406</u>

Consisting of:	<i>Book Value*</i>
U. S. Government Obligations	\$ 64,742
Industrial, Railroad, Public Utilities and Miscellaneous Bonds	1,173,534
Government Mortgages	219,890
Preferred Stocks	10,000
Common Stocks	1,124,899
Cash	4,341
	<u>\$2,597,406</u>

* The cash and approximate market value of the securities held as of December 31, 1961 totaled \$3,408,373.

MORGAN GUARANTY TRUST COMPANY OF NEW YORK,
Trustee

By WILLIAM F. LACKMAN,
Vice President

Following is a summary of the Retirement Fund Trust and the Travelers Insurance Company reserves at December 31, 1961:

Retirement Fund Trust — Morgan Guaranty Trust Company of New York, Trustee	\$2,597,406
Travelers Insurance Company Reserve for Annuities Purchased	3,876,936
TOTAL	<u>\$6,474,342</u>

STATISTICS

December 31, 1961

BED COMPLEMENT

	No. Beds		No. Beds
PRIVATE:		WARD:	
Presbyterian Hospital (Harkness Pavilion)	203	Presbyterian Hospital and Sloane Hospital:	
Babies Hospital	3	Medicine	102
Institute of Ophthalmology	19	Dermatology	8
Neurological Institute	63	Metabolism	10
Sloane Hospital	23	Surgery	114
Total Private	311	Urology	36
		Orthopedic	67
SEMI-PRIVATE:		Otolaryngology	12
Presbyterian Hospital and Sloane Hospital:		Admitting	14
All Services (Harkness Pavilion)	97	Gynecology	35
Medicine	9	Obstetrics	81
Surgery	14	Babies Hospital (including premature nursery of 23 incubators)	155
Urology	31	Institute of Ophthalmology	37
Orthopedic	55	Neurological Institute	106
Otolaryngology	21	Total Ward	777
Gynecology	13		1,517
Obstetrics	29	MARY HARKNESS UNIT	33
Babies Hospital	43		1,550
Institute of Ophthalmology	36	NEWBORNS (Sloane Hospital)	113
Neurological Institute	81	Total	1,663
Total Semi-Private	429		

HOSPITAL ADMISSIONS

	Admissions			Admissions	
	1961	1960		1961	1960
PRIVATE:			WARD:		
Presbyterian Hospital (Harkness Pavilion)	5,571	5,546	Presbyterian Hospital and Sloane Hospital:		
Babies Hospital	221	255	Medicine	1,528	1,560
Institute of Ophthalmology	792	713	Dermatology	117	113
Neurological Institute	1,328	1,191	Metabolism	130	130
Sloane Hospital	928	902	Surgery	1,931	2,006
Total Private	8,840	8,607	Urology	640	609
			Orthopedic	1,146	1,122
SEMI-PRIVATE:			Otolaryngology	560	500
Presbyterian Hospital and Sloane Hospital:			Admitting	906	1,057
All Services (Harkness Pavilion)	3,108	3,032	Gynecology	1,091	996
Medicine	197	155	Obstetrics	4,380	4,359
Surgery	278	342	Babies Hospital	2,874	2,983
Urology	734	719	Institute of Ophthalmology	922	937
Orthopedic	1,042	1,016	Neurological Institute	1,092	1,136
Otolaryngology	1,264	1,180	Total Ward	17,317	17,508
Gynecology	611	602	MARY HARKNESS UNIT	539	614
Obstetrics	939	954	Total	39,042	39,339
Babies Hospital	1,924	2,020			
Institute of Ophthalmology	1,480	1,636	INFANTS BORN IN SLOANE HOSPITAL:		
Neurological Institute	769	954	Private beds	689	663
Total Semi-Private	12,346	12,610	Semi-private and Ward beds	3,594	3,638
			Total	4,283	4,301

HOSPITAL OCCUPANCY

	Patient Days Care		Percentage of Occupancy	
	1961	1960	1961	1960
PRIVATE:				
Presbyterian Hospital (Harkness Pavilion)	72,403	72,082	97.7	97.0
Babies Hospital	635	699	58.0	63.7
Institute of Ophthalmology	6,095	5,697	87.9	81.9
Neurological Institute	20,989	17,870	91.3	75.2
Sloane Hospital	5,952	6,081	70.9	72.2
Total Private	106,074	102,429	93.4	90.9
SEMI-PRIVATE:				
Presbyterian Hospital and Sloane Hospital:				
All Services (Harkness Pavilion)	31,313	30,751	88.4	86.6
Medicine	3,128	3,127	95.2	94.9
Surgery	5,173	5,051	101.2	98.6
Urology	8,306	8,685	73.4	76.5
Orthopedic	16,215	15,558	80.8	77.3
Otolaryngology	5,257	5,414	68.6	70.4
Gynecology	5,509	5,715	116.1	120.1
Obstetrics	5,765	5,777	54.5	54.4
Babies Hospital	13,957	14,426	93.3	96.1
Institute of Ophthalmology	12,201	12,255	92.9	93.0
Neurological Institute	16,163	16,408	94.2	93.7
Total Semi-Private	122,987	123,167	85.7	85.4
WARD:				
Presbyterian Hospital and Sloane Hospital:				
Medicine	32,859	33,188	88.3	88.9
Dermatology	2,382	2,480	81.6	84.7
Metabolism	2,998	2,793	82.1	76.3
Surgery	35,915	36,235	86.3	86.8
Urology	11,622	11,162	88.4	84.7
Orthopedic	20,933	21,122	85.6	86.1
Otolaryngology	3,477	3,242	79.4	73.8
Admitting	2,389	2,512	46.8	49.0
Gynecology	10,944	11,504	85.7	89.8
Obstetrics	27,872	27,283	94.3	92.0
Babies Hospital	43,619	44,865	78.6	80.6
Institute of Ophthalmology	7,715	8,050	57.1	59.4
Neurological Institute	25,765	28,136	77.6	73.1
Total Ward	228,490	232,572	82.5	82.2
MARY HARKNESS UNIT	8,689	10,007	72.1	82.9
Total	466,240	468,175	85.4	84.8
INFANTS BORN IN SLOANE HOSPITAL:				
Private beds	4,653	4,705	55.4	55.9
Semi-private and Ward beds	22,233	22,309	67.7	67.7
Total	26,886	27,014	65.2	65.3

OUT-PATIENT DEPARTMENT STATISTICS

	1961	1960
Summary of Patients Treated:		
Number of patients treated	62,192	63,247
Number of visits:		
Free	101,670	106,419
Pay	294,791	295,450
Total	396,461	401,869
Average visits per working day	1,549	1,588

	New to Clinics	Revisits	Total Visits
Attendance Statistics:			
Dermatology	6,949	23,208	30,157
Emergency and Admitting Wards	25,694	4,451	30,145
Group Clinic	3,537	20,890	24,427
Medicine	3,360	33,105	36,465
Neurology	2,767	14,332	17,099
Obstetrics and Gynecology	9,090	34,687	43,777
Ophthalmology	4,900	22,371	27,271
Orthopedic	12,635	24,876	37,511
Otolaryngology	4,483	13,851	18,334
Pediatrics	6,364	35,730	42,094
Physical Medicine and Rehabilitation	1,438	17,005	18,443
Psychiatry	702	7,261	7,963
Surgery	22,703	30,020	52,723
Urology	1,867	8,185	10,052
Total	106,489	289,972	396,461

PERSONNEL STATISTICS

	On Duty December 31	
	1961	1960
Administration	12	11
Assistant Secretary-Treasurer	67	58
Comptroller	98	100
Public Interest	15	14
Mary Harkness Unit	32	30
Non-professional services:		
Buildings and grounds	575	577
Food service	365	379
Personnel and protective	80	80
Other non-professional services	171	178
Professional services:		
Nursing	1,331	1,324
Professional staff, doctors' offices and research	397	395
Special services	492	477
Vanderbilt Clinic and other	269	258
Total	3,904	3,881
Student Nurses	469	448
Volunteer Workers	477	444

COLUMBIA UNIVERSITY-PRESBYTERIAN HOSPITAL
SCHOOL OF NURSING ALUMNAE ASSOCIATION, INC.

BALANCE SHEET

December 31, 1961 and 1960

ASSETS

	1961	1960
Capital Funds — securities and cash.....	\$840,221.01	\$805,443.06
Operating Funds — securities, cash, etc.....	16,343.14	14,718.12
Total Assets	<u>\$856,564.15</u>	<u>\$820,161.18</u>

LIABILITIES

Capital Fund Reserves:		
General fund	\$ 17,148.73	\$ 15,918.15
Benefit fund	168,002.65	163,628.04
Pension fund	574,499.03	551,494.03
Scholarship funds:		
M. Elizabeth Deans Howell fund.....	912.45	505.44
Dorothy DeGraff Keim fund.....	1,050.00	
Emma B. Kennedy fund.....	29,944.31	28,333.50
Memorial fund, '20.....	4,123.99	2,966.98
June Moore fund.....	408.02	402.17
Richard William Walsh fund.....	2,227.74	2,097.31
Ruth C. Williams fund.....	3,019.30	2,779.50
Helen Young fund.....	38,884.79	37,317.94
Total capital fund reserves.....	<u>840,221.01</u>	<u>805,443.06</u>
Operating Funds Reserve.....	16,343.14	14,718.12
Total Liabilities	<u>\$856,564.15</u>	<u>\$820,161.18</u>

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

Cash on Hand January 1.....	\$ 9,256.77	\$ 6,135.81
Receipts:		
Sale of securities.....	36,364.67	15,985.33
Investment income	46,381.00	43,780.27
Donations	7,218.44	11,651.56
Dues and initiation fees.....	15,631.04	10,526.98
Dinner to graduating class.....	140.00	189.00
Loans repaid, etc.....	3,371.55	1,282.00
Total Receipts	<u>109,106.70</u>	<u>83,415.14</u>
	118,363.47	89,550.95
Disbursements:		
Purchase of securities.....	19,925.00	36,346.00
Clerical expense and fees.....	6,626.25	6,033.50
Pensions and benefits paid.....	23,091.00	20,484.00
Scholarships granted	4,400.00	2,700.00
Loans granted		100.00
Donations	25.00	25.00
Printing, stationery and postage.....	8,012.87	10,141.15
Entertainment of graduating class.....	2,218.29	2,176.40
Miscellaneous	4,667.03	2,288.13
Total Disbursements	<u>68,965.44</u>	<u>80,294.18</u>
Cash on Hand December 31.....	<u>\$ 49,398.03</u>	<u>\$ 9,256.77</u>

HELEN YOUNG, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

FOR THE AUXILIARY

For the Years 1961 and 1960

	<u>1961</u>	<u>1960</u>
Balance, January 1	\$ 39.00	\$ 2,539.18
Receipts:		
Membership dues	490.00	570.00
Donations		650.00
United Hospital Fund:		
Free Care Distribution	4,920.00	4,920.00
Direct Benefit	10,900.00	6,961.00
Greater New York Fund	6,010.00	5,635.00
Total Receipts	<u>22,320.00</u>	<u>18,736.00</u>
	<u>22,359.00</u>	<u>21,275.18</u>
Disbursements:		
To Babies Hospital for:		
Care of Ward and Clinic Patients	10,900.00	6,961.00
Emergency Nursing	3,500.00	7,500.00
Pediatric Psychiatric Clinic	1,500.00	1,500.00
Recreational Therapy	4,500.00	4,500.00
Volunteer service	500.00	500.00
Christmas Dolls and Toys	250.00	250.00
Miscellaneous	54.83	25.18
Total Disbursements	<u>21,204.83</u>	<u>21,236.18</u>
Balance, December 31	<u>\$ 1,154.17</u>	<u>\$ 39.00</u>

PRISCILLA M. WILLIAMS, *Treasurer*

BOARD OF WOMEN MANAGERS OF THE BABIES HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS
 FOR THE CRIBSIDE SOCIAL SERVICE COMMITTEE

For the Years 1961 and 1960

	<u>1961</u>	<u>1960</u>
Balance, January 1	\$ 8,377.15	\$ 7,648.03
Receipts:		
Membership dues	280.00	250.00
Donations	857.09	295.00
United Hospital Fund	6,902.00	7,301.00
Greater New York Fund	8,429.00	7,905.00
Investment income	782.00	754.92
Bargain Box Thrift Shop	7,690.47	8,474.38
Sewing Class dues and receipts	317.00	405.32
Repayments by patients of advances and loans	545.00	348.50
Total Receipts	<u>25,802.56</u>	<u>25,734.12</u>
	<u>34,179.71</u>	<u>33,382.15</u>
Disbursements:		
Social service salaries	21,247.75	20,761.74
Travel of social service staff	69.88	100.77
Conference expenses, dues, subscriptions and meetings	52.10	169.69
Camping for handicapped children	1,586.40	875.16
Advances to patients for convalescent care and miscellaneous loans	545.00	348.50
Relief assistance and extra for patients:		
Clothing	909.60	712.66
Milk and food	136.70	303.00
Christmas and Thanksgiving	546.93	255.59
Other	226.53	69.50
To Babies Hospital for:		
Emergency Nursing		500.00
Social Service Scholarships		810.00
Miscellaneous	23.10	98.39
Total Disbursements	<u>25,343.99</u>	<u>25,005.00</u>
Balance, December 31	<u>\$ 8,835.72</u>	<u>\$ 8,377.15</u>

EDITH FENNELLY, *Chairman*

NEUROLOGICAL INSTITUTE AUXILIARY

SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1961 and 1960

	<u>1961</u>	<u>1960</u>
Balance, January 1	\$19,583.23	\$14,286.45
Receipts:		
Membership dues	395.00	370.00
Donations	2,937.00	1,065.00
United Hospital Fund:		
Free Care Distribution.....	10,626.00	10,625.00
Direct Benefit	7,937.00	6,024.00
Greater New York Fund.....	12,979.00	12,171.00
Everybody's Thrift Shop.....	15,610.31	17,144.13
Repayments by patients of advances and loans.....	156.00	237.15
Total Receipts	<u>50,640.31</u>	<u>47,636.28</u>
	<u>70,223.54</u>	<u>61,922.73</u>
Disbursements:		
Social service salaries.....	25,226.90	23,596.09
Social service scholarship.....	2,500.00	
To Neurological Institute for:		
Care of Ward and Clinic Patients.....	7,937.00	6,024.00
Library	3,654.10	2,640.13
Special Nursing Fund.....	3,000.00	3,000.00
Volunteer service	1,900.00	1,900.00
Advances to patients for summer therapeutic care and miscellaneous.....	156.00	237.15
Summer therapeutic care.....	6,189.00	2,064.00
Chronic care	266.10	809.85
Medical relief	1,850.82	1,451.81
Staff travel, field and conference.....	24.45	60.39
Miscellaneous, postage, telephone and publications.....	448.29	556.08
Total Disbursements	<u>53,152.66</u>	<u>42,339.50</u>
Balance, December 31	<u>\$17,070.88</u>	<u>\$19,583.23</u>

HELEN L. WEINBERG, *Chairman*

WOMEN'S AUXILIARY OF THE NEW YORK ORTHOPEDIC HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1961 and 1960

	<u>1961</u>	<u>1960</u>
Balance, January 1.....	\$28,451.08	\$23,295.79
Receipts:		
Donations	8,112.09	7,204.00
Investment income for use in Recreational Therapy.....	1,570.47	1,386.61
United Hospital Fund:		
Direct Benefits	14,326.00	17,011.00
Occupational Therapy Aide.....	450.00	
Allocation from United Hospital Fund and Greater New York Fund		
Distribution	4,000.00	4,000.00
Other (Portrait Show)	10.00	4,228.83
Total Receipts	<u>28,468.56</u>	<u>33,830.44</u>
	<u>56,919.64</u>	<u>57,126.23</u>
Disbursements:		
Recreational therapist salary.....	6,829.76	6,645.54
Other recreational therapy expenses.....	401.24	1,062.32
To Presbyterian Hospital for:		
Care of Ward and Clinic Patients.....	14,326.00	17,011.00
House Staff Loan Fund.....	1,000.00	1,000.00
Library	1,518.00	1,179.99
Occupational Therapy Aides.....	853.20	
Volunteer service	1,100.00	1,100.00
Scholarship Aid for Graduate Nurses.....	500.00	500.00
Miscellaneous	285.00	176.30
Total Disbursements	<u>26,813.20</u>	<u>28,675.15</u>
Balance, December 31.....	<u>\$30,106.44</u>	<u>\$28,451.08</u>

VIRGINIA S. HUTTON, *Treasurer*

WOMEN'S AUXILIARY OF THE PRESBYTERIAN HOSPITAL
SUMMARY OF CASH RECEIPTS AND DISBURSEMENTS

For the Years 1961 and 1960

	<u>1961</u>	<u>1960</u>
Balance, January 1.....	\$ 3,510.42	\$ 3,369.51
Receipts:		
Membership dues	677.50	675.00
United Hospital Fund:		
Free Care Distribution.....	6,697.00	6,696.00
Direct Benefit	13,672.00	6,577.00
Greater New York Fund.....	8,180.00	7,670.00
Donations	52.50	50.00
Stuyvesant Square Thrift Shop.....	6,365.45	8,039.04
Total Receipts	<u>35,644.45</u>	<u>29,707.04</u>
	<u>39,154.87</u>	<u>33,076.55</u>
Disbursements:		
To Presbyterian Hospital:		
Care of Ward and Clinic Patients.....	13,672.00	6,577.00
Occupational Therapy	6,000.00	6,000.00
House Staff Loan Fund.....		1,800.00
Library	8,890.30	7,215.62
Social Service Staff Development Fund.....	400.00	400.00
Volunteer service	7,200.00	7,200.00
Miscellaneous	295.14	373.51
Total Disbursements	<u>36,457.44</u>	<u>29,566.13</u>
Balance, December 31.....	<u>\$ 2,697.43</u>	<u>\$ 3,510.42</u>

NANCY V. BARRETT, *Treasurer*

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

BALANCE SHEET

December 31, 1961 and 1960

ASSETS

	December 31	
	1961	1960
CURRENT FUNDS ASSETS:		
Cash	\$ 314,319	\$ 269,463
Savings accounts	1,500,000	
Bonds and stocks — at cost (market value — 1961, \$833,427)	832,389	960,172
TOTAL CURRENT FUNDS ASSETS	<u>2,646,708</u>	<u>1,229,635</u>
ENDOWMENT FUNDS ASSETS:		
Cash	23,556	35,118
Bonds and stocks — at cost or contributed value (market value — 1961, \$2,677,491)	2,629,333	2,465,132
TOTAL ENDOWMENT FUNDS ASSETS	<u>2,652,889</u>	<u>2,500,250</u>
TOTAL	<u>\$5,299,597</u>	<u>\$3,729,885</u>

FUNDS AND LIABILITIES

CURRENT FUNDS AND LIABILITIES:		
Accrued expenses	\$ 24,018	\$ 15,679
Special expendable funds	1,487,063	118,279
General fund	1,135,627	1,095,677
TOTAL CURRENT FUNDS AND LIABILITIES	<u>2,646,708</u>	<u>1,229,635</u>
ENDOWMENT FUNDS	<u>2,652,889</u>	<u>2,500,250</u>
TOTAL	<u>\$5,299,597</u>	<u>\$3,729,885</u>

NOTE:

The above corporation was established on January 21, 1960, to obtain funds to be used for the joint educational, scientific and charitable purposes now carried on by The Presbyterian Hospital in the City of New York and The Trustees of Columbia University in the City of New York through the Columbia-Presbyterian Medical Center.

The accompanying financial statements do not include uncollected pledges, nor do they include amounts contributed directly to Columbia University or The Presbyterian Hospital in the City of New York for the development program of the Columbia-Presbyterian Medical Center.

COLUMBIA-PRESBYTERIAN MEDICAL CENTER FUND, INC.

SUMMARY OF FUND CHANGES

For the Years Ended December 31, 1961 and 1960

	Year Ended December 31	
	1961	1960
GENERAL FUND		
Balance, January 1	\$1,095,677	
Add:		
Unrestricted contributions	1,121,460	\$1,319,098
Investment income	49,606	924
	1,171,066	1,320,022
Deduct — Fund raising expenses for Columbia-Presbyterian Medical Center development program	281,640	224,345
Excess of unrestricted contributions and income over expenses	889,426	1,095,677
Total	1,985,103	1,095,677
Less — Distribution to Presbyterian Hospital for construction purposes	849,476	
Balance, December 31	\$1,135,627	\$1,095,677
SPECIAL EXPENDABLE FUNDS		
Balance, January 1	\$ 118,279	
Add:		
Contributions	1,398,736	\$ 103,152
Investment income	68,054	15,127
	1,466,790	118,279
Total	1,585,069	118,279
Deduct:		
Distributions to:		
Presbyterian Hospital for construction purposes	58,724	
Presbyterian Hospital for residents' stipends	5,208	
Columbia University for faculty salaries	34,074	
	98,006	
Balance, December 31	\$1,487,063	\$ 118,279
ENDOWMENT FUNDS		
Balance, January 1	\$2,500,250	
Add:		
Contributions	152,639	\$2,500,250
Balance, December 31	\$2,652,889	\$2,500,250

ACCOUNTANT'S OPINION

COLUMBIA-PRESBYTERIAN
MEDICAL CENTER FUND, INC.:

We have examined the balance sheet of Columbia-Presbyterian Medical Center Fund, Inc. as of December 31, 1961 and the related summary of fund changes for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances; as to contributions, it was not practicable for us to extend our examination beyond the Fund's accounting for recorded receipts.

In our opinion, the accompanying balance sheet and summary of fund changes present fairly the financial position of the Fund at December 31, 1961 and, in summarized form, the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

HASKINS & SELLS
Certified Public AccountantsNew York
February 21, 1962

Endowed Beds

(1) A gift of \$10,000 shall entitle the donor to nominate a patient to use and occupy one bed in the common wards of the Hospital free of charge (except for special service) for not more than ninety days in any one year.

The donor may at the time of making the gift appoint to another in his stead such right to nominate, provided the appointee is acceptable to the Hospital.

Such right to nominate may be exercised only: —

(a) During the life of the person having the right to nominate, if such right is in an individual.

(b) For a period of fifteen years, if such right is in a Corporation, Society or Association.

(2) Endowed Bed privileges are subject to all rules and regulations governing the admission, treatment, and discharge of patients.

(3) The Board of Trustees may in their discretion under special circumstances accept gifts for the endowment of beds on such other terms and conditions as they may deem best calculated to promote the objects for which the Hospital was established and is maintained.

(4) Periodic gifts may be made until endowment of a bed is completed, at which time the right to nominate shall commence.

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

A gift of \$10,000 shall entitle the donor to establish as a permanent memorial one memorial endowed bed for research purposes in a ward of the Hospital to be used and occupied by patients free of charge, except for special service.

The President of the Medical Board shall, subject to the approval of the Executive Vice President of the Hospital, have the privilege of nominating patients to use and occupy a Memorial Endowed Bed for Research Purposes for not more than ninety days in any one year for a period of fifteen years, subject to all rules and regulations governing the admission, treatment and discharge of patients. This privilege shall be assigned to the persons occupying these respective offices (President of the Medical Board and Executive Vice President of the Hospital) at the time the nomination is made.

Endowed Beds and Rooms

Presbyterian Hospital

- 1868 Mary J. Gelston
- 1870 Henrietta A. Lenox (2 Beds)
Washington R. Vermilyea
A. R. Wetmore
- 1871 John Laurie
Mary Ann Parish
- 1872 William Earl Dodge
John T. Johnston
Otis D. Swan
Henry Young (2 Beds)

- 1873 James Brown (2 Beds)
John R. Ford
Jonathan Sturges
- 1878 James G. and Henry G. deForest, in memory of
Lockwood deForest Woodruff, M.D.
- 1880 William C. Rhinelander
- 1881 Jennet L. and Robert L. Belknap, in memory of
Aaron B. Belknap
Fifth Avenue Presbyterian Church
Henry B. Hyde, in memory of his son,
Henry B. Hyde, Jr.
John Stewart Kennedy
Frederick and Henry G. Marquand
Edwin D. Morgan (3 Beds)
Mary L. Sheafe
John L. Proudfit
- 1882 Heber R. Bishop (3 Beds)
Mrs. Robert L. Stuart, in memory of her father,
Robert McCrea
Edwin D. Morgan
Mrs. Moses Taylor
- 1883 Frederick Billings
Reformed Protestant Dutch Church of the
City of New York
- 1884 Nathaniel W. Conkling
West Presbyterian Church, to be known as
"Faith Presbyterian Church Bed"
Madison Square Presbyterian Church, in memory
of George W. Lane
- 1885 Brick Presbyterian Church, in memory
of Dr. John G. Adams
Richard Irvin
- 1886 Frederick Baker, in memory of
Sarah Pyewell Baker
Edward L. Beadle
Brick Presbyterian Church, in memory of
Miss Ann Adams
Fourth Avenue Presbyterian Church Bed by Peter
Cumming, in memory of Francis P. Schoals
George E. Dodge
Horace F. Hutchinson, in memory of
Ellen B. Schoals
Mr. and Mrs. William D. Sloane, in memory of
their son, William D. Sloane, Jr.
Henry S. Wilson, in memory of his son,
Harry H. Wilson
- 1887 Fifth Avenue Presbyterian Church
- 1888 Broadway Tabernacle Society
Samuel Inslee, in memory of Kate J. Inslee
- 1889 John Sloane, in memory of his mother,
Euphemia Sloane
- 1890 Isaac V. Brokaw, in memory of Ernest B. Brokaw
Sidney Dillon, in memory of Hannah Dillon
Ambrose K. Ely
Josiah M. Fiske
O. B. Jennings

- Mrs. John Stewart Kennedy
Amelia Kerr
Robert Marshall
Elizabeth S. and Emily M. Wheeler, in memory of
James Boorman
"The Davenport Bed"
- 1891 Sarah A. Havemeyer, in memory of her son,
Hector C. Havemeyer
Thomas Hope
John E. Parsons, in memory of his children,
E. L. P., K. M. P., and R. M. P.
Mrs. A. R. Van Nest, in memory of her husband,
Abram R. Van Nest
- 1892 John Stewart Kennedy, in memory of his niece,
Emma Stewart Baker
Alexander Maitland, in memory of his mother,
Mary C. Maitland
- 1893 Maria S. Auchincloss, in memory of her husband,
Edgar S. Auchincloss
Frances T. Lord, in memory of her husband,
George deForest Lord
Presbyterian Church on University Place
Presbyterian Home for Aged Women
Margaret A. Sinclair, in memory of
Mr. and Mrs. James Sinclair
West-Park Presbyterian Church
Young Men's Christian Association
- 1895 Mary Harrison
Mrs. Clarence M. Hyde, in memory of her mother,
Rebecca Babbitt
John Stewart Kennedy, in memory of
Mrs. Robert L. Stewart
Mrs. James T. Murray, in memory of her husband,
James T. Murray
- 1896 Anthony Dey, in memory of Joseph G.
and Eliza D. Scott
Jane Hope
Esther J. Jennings, in memory of her husband,
Oliver B. Jennings
- 1897 Mrs. Frances E. Baker, in memory of her father,
James Rich Steers
William S. Brown
Helen Miller Gould, in memory of her parents,
Mr. and Mrs. Jay Gould
Margarette E. and Susan D. Griffith, in memory of
their father, Griffith W. Griffith
Mary J. Griffith, in memory of her husband,
Griffith W. Griffith
Rachel L. Kennedy, in memory of her mother,
Mrs. Rachel C. Kennedy
Annie S. Paton, in memory of her husband,
William Paton
Charlotte H. Skidmore, to be known as
"The William L. Skidmore Bed"
- 1898 Brick Presbyterian Church
Matilda A. Brown, in memory of her son,
H. Auchincloss Brown
First Presbyterian Church
Mrs. Stephen V. Harkness, in memory of her
daughter, Florence Harkness
Jane Hope, in memory of her mother,
Grace Corrie Hope
John Stewart Kennedy, in memory of
Rev. William G. Schauffler, D.D., LL.D.
- Mrs. Elliott F. Shepard, in memory of her
daughter, Florence Vanderbilt Shepard
Mrs. Elliott F. Shepard, in memory of her
daughter, Marguerite Shepard
- 1899 William W. Cole, in memory of his mother,
Mary A. Cole
William Whitewright, in memory of his father,
William Whitewright, "The Whitewright Beds"
(10 Beds)
- 1900 Emily B. Hopkins, in memory of her husband,
Moses Hopkins, "Moses Hopkins Memorial"
Donald MacKay, in memory of his children,
Edith Winslow and Walter Wise MacKay
Caroline L. Macy, in memory of her daughter,
Mary M. K. Willets
Laura Roome, in memory of her sons,
Harry and Alfred Roome
Martha L. St. John, in memory of her mother,
Sarah Ward
Nathaniel Whitman
- 1901 Julia Billings, in memory of her husband,
Frederick Billings
Camilla L. Edwards, in memory of her husband,
Walter Edwards
Andrew J. Garvey, in memory of his mother,
Elizabeth Jeffries Garvey (2 Beds)
George Lauder
Charles H. Marshall
Justine Adele Stafford, in memory of her father,
Justin A. Bliss
- 1902 Robert Graham Dun
Margaret J. Plant, in memory of her brother,
Simon Loughman
- 1903 Heber R. Bishop
Lura Currier
Mrs. Francis B. Harrison
Julia J. MacCartee, in memory of her husband,
Robert MacCartee
Madison Avenue Reformed Church
Adele Berry Sloane, in memory of her father,
Abraham J. Berry, M.D.
Justine Adele Stafford, in memory of her mother,
Eveline C. Bliss
John T. Terry
- 1904 Virginia E. Fowler, in memory of
Clarence E. Fowler
Susan Bevier
Mrs. William Starr Miller
Josephine Penford, in memory of
Dr. Edward Livingston Trudeau, Jr.
Peter Reid, in memory of his wife,
Jane Watson Reid
Francis A. Palmer
- 1905 Frederick G. Bourne
Mr. and Mrs. Albert H. Gallatin
Helen C. Inslee, in memory of her husband,
Samuel Inslee
Titus B. Meigs, in memory of his son,
Titus B. Meigs, Jr.
Mrs. James T. Murray, in memory of
Rev. John Hall, D.D., LL.D.
Sarah J. Parsons, in memory of her husband,
Charles Parsons
Presbyterian Church on University Place

- 1906 Maria L. Campbell, in memory of
Henry Pearsall Campbell
Susan W. Duncan, in memory of her husband,
John P. Duncan
Samuel Keyser (3 Beds)
Sara Pyle McAlpin and James Tolman Pyle,
in memory of their father, William Scott Pyle
Reformed Protestant Dutch Church of
Garden Street
John Sloane, in memory of his brother,
Thomas Chalmers Sloane
John Sloane, in memory of his father,
William Sloane
- 1908 William R. Craig, in memory of his sister,
Florence Faxon Craig
George B. Goldschmidt, in memory of his mother,
Celestine Goldschmidt
Samuel Anthony Goldschmidt, in memory of
his mother, Celestine Goldschmidt
Mrs. Stephen V. Harkness, in memory of her
husband, Stephen V. Harkness
Charles H. Marshall, Jr.
- 1909 Rev. and Mrs. Robert Russell Booth, in memory of
"Minnie and Willie"
Canadian Society of New York
Edward West Currier, in memory of his
stepmother, Laura Currier
Edward West Currier, in memory of his
stepbrother, Walter B. Currier
Edward West Currier, in memory of
Edward W. Currier
Mary Jane Johnson, in memory of her husband,
William H. Johnson
J. Theresa Keyser, in memory of her husband,
Samuel Keyser
Julia Hannon Lyle
Winfield Tucker, in memory of Joseph, Isabelle
and Adeline (3 Beds)
J. Spencer Turner, in memory of his first wife,
Cornelia J. Turner
- 1910 Jane A. Townsend, in memory of her son,
Randolph W. Townsend, Jr.
Jane A. Townsend, in memory of her son,
Harmon W. Norton
Jane A. Townsend, in memory of her daughter,
Emma L. Norton
Amelia Mott Graham, in memory of
Malcolm Graham
Adeline Ives Latham, in memory of her husband,
John Howard Latham
Josephine G. Lord, in memory of her husband,
Franklin B. Lord
- 1911 Brearley School Girls and others interested, in
memory of Madam Bertha Beck,
"Madam Beck Memorial Teacher's Bed"
Harriet Coles, in memory of her sisters,
Susan and Anna Codman
Caroline Thorn Kissel, in memory of her husband,
Gustav Edward Kissel
Katherine Spencer Leavitt, in memory of her
husband, Rev. William Leavitt (2 Beds)
Reformed Low Dutch Church of Harlem
Frederick Sturges, in memory of his father,
Jonathan Sturges
- William Stuart Tod, in memory of his brother,
George Tod
- 1912 Melville de Wolf, in Children's Ward,
"Emma de Wolf Bed"
Gustavia A. Senff, in memory of her husband,
Charles A. Senff
Mrs. Christopher M. Bell, "The Dennistoun Bed"
Cornelia Eaton, to be known as "The Dr. Reuben
S. Carpentier Memorial" (3 Beds)
Mrs. Jeremiah V. Meserole, in memory of her son,
Abraham Meserole
Josephine Penfold
Jane G. Phelps, in memory of her husband,
Anson G. Phelps, Jr. (2 Beds)
- 1914 Hugh D. Auchincloss, in memory of his mother,
Elizabeth Auchincloss
Jane Elizabeth Grannis, in memory of her mother,
"Charlotte Williams Platt Bed"
William H. Penfold, in memory of
Josephine Penfold
Louise Tillinghast, in memory of her sister,
Amelia C. Babcock
Minnie Hackett Trowbridge (6 Beds)
- 1915 A Friend, in memory of Sophia Kellogg Stebbins
and Mary Tompkins Kimball
A Friend
Mrs. Jeremiah V. Meserole, in memory of her
father-in-law, Abraham Meserole
Mrs. Jeremiah V. Meserole, in memory of her
husband, Jeremiah Vanderbilt Meserole
Mrs. Jeremiah V. Meserole, in memory of her
brother, Adolphus Clock
Mrs. Jeremiah V. Meserole, in memory of her
parents, Alfred and Anna Maria Clock
- 1916 Emil C. Bondy, in memory of
Margaret Carson Cowan
Central Presbyterian Church
Mr. and Mrs. James Petrie Chalmers, in memory
of James Petrie Chalmers, Jr., "Chalmers
Memorial Bed"
Robert A. Chambers, in memory of his father,
Robert Chambers
Dunlevy Milbank, in memory of his mother,
Ella Dunlevy Milbank
William D. Sloane (3 Beds)
- 1917 Emeline Y. Danforth, in memory of
Mrs. William B. Jenkins
Harris Brisbane Dick, to be known as the
"Harris Brisbane Dick Free Bed"
Sarah C. Miller
Albert Winter, in memory of
Adaline Benson Winter
- 1918 Ida Leora Olmstead, to be known as
"Leora McCammon Bed"
- 1919 Samuel Elliott
Elizabeth Keys, in memory of her daughter,
Edith Keys
Rutgers Presbyterian Church
James R. Steers, in memory of his former wife,
Rebecca E. Steers
John W. Sterling
- 1920 William C. Boschen, to be known as the
"Boschen Bed"
Rosa Franklin (4 Beds)

- Francis P. Furnald
Mrs. Francis P. Furnald
Mary A. Harriot, to be known as the
"Margaret Harriot Alms"
Mary A. Harriot, to be known as the
"James Harriot Alms"
Mrs. Henry O. Havemeyer, in memory of her
parents, George William and Matilda Adelaide
Elder
Margaret J. Orr, in memory of her mother,
Ann Boyd Orr
Anna St. John, in memory of her brother,
Milton St. John
- 1921 Mrs. Peter B. Wyckoff, to be known as the
"Sidney Dillon Bed"
Henry M. Gescheidt
Ralph E. Prime, in memory of his daughter,
Ruth Havens Prime
Joseph K. Gwynn
Charles S. Ward, in memory of his friend,
Sophie L. Kinman
Charles S. Ward
- 1922 Minetta C. Howenstine (8 Beds)
Christina C. Munro, in memory of her husband,
John Munro
Anna M. Romaine, in memory of
Dr. William I. Detmold
Arnold Thayer (2 Beds)
Hamilton B. Tompkins, in memory of his wife
and himself
- 1923 Lydia Augusta Brown
Josephine Newman Hall
- 1924 Bohemian Society "Lidumil"
Cordelia F. Turrell
Nannie Gyles Johnson (Children's Ward),
in memory of her son, Shirley Everton Johnson
Mrs. William John Fitzgerald
- 1925 Christina Bond
In memory of Julia C. Skidmore
George Clarke
Elizabeth J. Hofer (2 Beds)
In memory of Catherine Parke and
Horatio C. Kretchmar
Edward M. Morgan Memorial Association
(4 Beds)
In memory of Edward M. Morgan
Jennette Robertson, to be known as
"Helen C. Inslee Endowed Bed"
- 1926 Elizabeth Ellen Auchincloss, to be known as
"E. E. Auchincloss, Jr. Bed"
Members of the New York Stock Exchange,
to be known as the "Seymour LeGrande
Cromwell Memorial" (2 Beds)
Edmund Penfold, in memory of
Josephine Penfold and William Hall Penfold
(2 Beds)
Dr. M. Allen Starr, in memory of
Allen Egbert Starr
John B. Trevor, in memory of Emily N. Trevor
West End Collegiate Church
George D. Widener
- 1927 Second Presbyterian Church in the
City of New York
Ellen Mills Borne, in the Children's Ward,
to be known as "John E. Borne Bed" and
"Nellie M. Borne Bed" (2 Beds)
Virginia Marquand Monroe, in the name of the
Young Men's Christian Association
Mrs. Charles H. Senff, to be known as
"Dr. George A. Tuttle Bed"
W. Frazer Gibson, in memory of his mother,
Jeanette Frazer Gibson, to be known as
"Jeanette Frazer Gibson Bed"
Augustus C. Gurnee, in memory of his mother,
Mary M. Gurnee (2 Beds)
Eliza V. Nicholson
Mrs. Murray W. Dodge and Mrs. Franklin Lord,
in memory of their mother,
Mrs. Fordyce D. Barker (Single Ward Room)
Dunlevy Milbank (Single Ward Room)
F. Ethel Wickham, in memory of her father,
William Hull Wickham, to be known as "William
Hull Wickham Bed" (Single Ward Room)
Anna A. Johnston, in memory of her parents,
William G. and Adriana C. Gardner
Anna A. Johnston, in memory of Lewis, Anna,
Edward and Mary Johnston (Single
Ward Room)
Broadway Presbyterian Church, to be known as
the "Walter Duncan Buchanan Bed"
- 1928 North Presbyterian Church
In memory of McKevers Bayard Brown
(Single Ward Room)
Caroline B. Sellev (4 Beds)
Red Cross Rooms for Nurses
(3 Single Ward Rooms)
Robert W. deForest (Single Ward Room)
Henry W. deForest (Single Ward Room)
James R. Steers
Jane Livingston Armour, in memory of
John A. Livingston
Jane Livingston Armour, in memory of
Herman O. Armour
In memory of Meredith Howland Pyne
Stella C. and Roi C. Megrue (Single Ward Room)
Mrs. E. C. Wills, in memory of her mother,
Mrs. J. F. Ackerman, and her sister,
Mrs. W. Clarence Reed
- 1929 Caroline White, in memory of her sister,
Eliza W. White
Elizabeth A. Hays, in memory of William and
Charlotta Hays
- 1930 Mr. and Mrs. Ernest Trow Carter
The Presbyterian Church in the Town of
Rye, New York
Mrs. Arthur E. Lauderbach, in memory of her
mother and father, Esther Hull Jackson and
Peter A. H. Jackson
Mary L. Walker Peters, to be known as "The
Charles Grenville Peters and Mary Walker
Peters Free Bed"
Marie F. Coddington, to be known as
"The Emilie Coddington Bed"
- 1931 Mrs. Clara Beales Obrig, in memory of Adolph
Obrig and Clara Beales Obrig (Single Ward
Room)
Alfred V. Meserole, in memory of his mother,
Evelina A. Meserole

- 1932 In loving memory of Justine Adele Stafford (Mrs. W. F. Stafford) by her sister, Ida Evelina Bliss
- 1933 Mrs. John A. Hance and Mrs. Irene Louise Hance, in memory of James R. Jesup
- 1934 Ida Adams, in memory of her sister, Sadie E. and her brother, Robert F. Adams (Single Ward Room)
Josephine Leypoldt, in memory of her brothers, Louis and Frederick Leypoldt (2 Beds)
- 1935 Walter J. M. Donovan, in memory of his father, Timothy Donovan
- 1936 Elizabeth P. Hewes, to be known as "The Elizabeth P. Hewes Bed"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
Mary S. Thayer, to be known as "The Orlando Thayer Bed"
- 1937 Margaretta J. Gamble, to be known as "The Gamble Bed," in memory of her father and mother
Jeremiah Milbank, in memory of his father, the late Joseph Milbank
- 1938 Susetta L. Goss, to be known as "The Goss Bed," in memory of her parents, Rev. C. C. Goss and Theodosia C. Goss
Annie Miller, to be known as "The Mrs. Alexander Miller Memorial Bed," in memory of her mother, Mrs. Alexander Miller
Bertha H. Minturn, in memory of her most faithful and beloved nurse, Mary Humphries
Henry T. Sloane, to be known as "The Euphemia Sloane Coffin Bed," in memory of his sister, Euphemia Sloane Coffin
- 1939 "In Memoriam"
Dunlevy Milbank, in memory of his mother, Ella Dunlevy Milbank
- 1940 George Gibbs, to be known as "The George Gibbs Bed"
- 1942 Mrs. Huntington McLane, to be known as the "Therese K. Thorne Bed," in memory of her mother
Cornelia Livingston Pell, in memory of Alfred Duane Pell
Frank Wallach, in memory of Ida May Wallach
- 1943 Stuart Duncan, to be known as "The Stuart Duncan Bed"
- 1944 Anonymous, to be known as "The Dr. William Darrach Bed"
John Fraser, in memory of his parents, Alexander and Elizabeth Fraser
- 1945 Robert W. Carle, in memory of his mother, to be known as the "Cornelia Willets Carle Bed" for general hospital use including harelip and cleft palate cases
- 1947 W. and J. Sloane
Frederick Sturges, Jr., Mrs. Mary Armit Sturges, Mrs. Catharine Armit Chapman and Frederick Sturges, III, in memory of Frederick Sturges
Walter S. Gifford, in memory of his son, Walter Sherman Gifford, Jr.
Ida L. Darling, known as the "Richards Memorial Bed"
- John Sloane, in memory of his wife, Elsie Nicoll Sloane, to be known as the "Elsie Nicoll Sloane Bed"
- Elisa Smith Mabon, in memory of her husband, James Brown Mabon
- 1948 Otto M. Eidlitz, to be known as the "Eidlitz Bed"
- 1949 Effie B. Shearman
- 1950 Isabel Shields Kemp, to be known as "Mary M. Shields and the Dr. Robert Coleman Kemp Free Bed"
- 1951 Gerrish Hill Milliken
- 1952 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
- 1953 Estate of Charlotte C. Garretson, to be known as the "Charlotte Higbee Kelsey Bed"
W. Alton Jones Foundation, Inc., to be known as the "Nettie Marie Jones Bed"
- 1954 Estate of M. Samuel Stern, to be known as the "M. Samuel Stern Memorial"
- 1955 Estate of Robert J. Eidlitz, to be known as the "Marc Eidlitz Bed"
Mrs. John S. Holbrook, in memory of her parents, John Johnston and Mary Sloane Sinclair
- 1956 Estate of Aurie Dell Black, to be known as the "Aurie Dell Black Bed"
Robert W. Carle, to be known as the "Adele Skiddy Carle Bed"
Estate of Adolph Riesenbergs, to be known as "The Adolph and Anna A. Riesenbergs Bed"
- 1957 George F. Cahill, M.D., to be known as the "Endowed Bed for Personnel of the Squier Urological Clinic"
Edward H. Carle, in memory of his father, to be known as the "John J. Carle Bed"
Mrs. William J. Demorest, in memory of her parents, Wealthy H. Lewis and Richard James Lewis
Chancellor Kent Lodge 870, Free and Accepted Masons, in memory of George J. Weissman
Morris Morgenstern Foundation, to be known as the "Sadie B. Morgenstern Bed"
Estate of Mary Ross Potter, to be known as the "Georgianna Morley Bed"
Estate of Mathilde S. Sterne, to be known as the "Simon Sterne Beds" (4 Beds)
Board of Trustees of The Presbyterian Hospital, in honor of and to be known as the "Charles P. Cooper Endowed Bed"
- 1958 Mrs. Robert W. Carle, to be known as the "Robert W. Carle Bed"
- 1959 William Dzus, to be known as the "Ukrainian Institute of America, Inc. Bed"
Mrs. Stanley G. Mortimer, to be known as the "Stanley G. Mortimer Bed," in memory of her husband
Mrs. John S. Thacher, to be known as the "Frances E. Baker Bed," in memory of her mother
- 1960 Estate of Exerene L. Flood, to be known as the "Dr. George Ballery Flood Endowed Bed"
Minister, Elders and Deacons of The Reformed Protestant Dutch Church of The City of New York, to be known as "The May A. Ingenthron Memorial Bed"

- Estate of James Miller, to be known as the
"A. Miller Endowed Bed"
- Estate of Joan D. Sanger, to be known as the
"Bertram J. Sanger Endowed Beds" (2 Beds)
- 1961 Estate of Ellen Clarke Bertrand, to be known as
the Ellen Clarke Bertrand Memorial Endowed
Bed
- Mr. and Mrs. Samuel W. Meek, in memory of
Michael Jeremy Meek

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

- 1948 Mrs. William Barclay Parsons, in memory of her
husband, William Barclay Parsons
Muriel Jane Rudinger Foundation, Inc., to be
known as the "Muriel Jane Rudinger Bed"
- 1950 Charles E. Culpeper Foundation, Inc. (2 Beds)
- 1952 John F. Bush Memorial Bed
Estate of Selma Boyd, each to be known as a
"Boyd Bed" (2 Beds)
Bruce Barton, in memory of his wife, to be known
as the "Esther Randall Barton Memorial Bed"
- 1953 Herman Goldman Foundation, Inc., in memory of
Theresa and Frank Goldman
W. Alton Jones Foundation, Inc., in memory of
Mamie W. Marvin
- 1954 Mr. and Mrs. Charles P. Cooper, in memory of
Mrs. Cooper's father, Doctor Charles
Lathrop Parsons
John Shepard Parke Memorial Bed
Mr. and Mrs. Sidney J. Weinberg, in memory of
their parents
- 1955 Bruce Barton, in memory of Clyde Scott and
Helen Barton Stilwell, to be known as the
"Clyde Scott and Helen Barton Stilwell
Memorial Bed"
- George F. Cahill, M.D., Research Bed in the
Department of Urology
- Mr. and Mrs. Charles P. Cooper, in memory of
Mrs. Cooper's mother, Mrs. Charles Lathrop
Parsons
- Herman Goldman Foundation, Inc., in memory of
Theresa and Frank Goldman
- Williams-Adler Foundation Bed
- 1959 "John Shepard Parke Memorial Bed"

ENDOWED ROOMS

- 1903 Henry H. Rogers
- 1905 Mrs. Morris K. Jesup, to be known as the
"Eliza de Witt Memorial Room"
- 1910 Mrs. John Stewart Kennedy, in memory of her
husband, to be known as the "J. S. K.
Memorial Room"
- 1912 Peter Cumming, to be known as
"Peter Cumming Memorial Room"
- 1926 Alumnae Association of the School of Nursing of
The Presbyterian Hospital, to be known as the
"Amabel S. Roberts Memorial Room"
- 1928 Mrs. William Sloane, to be known as "The
William Sloane Room for Graduate Nurses"
- 1930 The Sarah A. Hard Taylor Memorial Fund, to be
known as "The Sarah A. Hard Taylor Room"

- 1935 Mrs. Herbert Neal, in memory of her husband,
James Norman Hill
- 1937 S. Augusta Mora, in memory of her husband,
Frank Mora and mother, Sarah Robson
Van De Water
- 1960 Mr. and Mrs. Robert W. Carle, to be known as
"The Robert W. and Adele S. Carle
Endowed Room"
- 1961 Estate of Sarah Louise Johnston, to be known as
the "Andrew Johnston Memorial Room"
- Estate of Bertha C. Miller, to be known as the
"James Miller Endowed Room"

Babies Hospital

- 1892 The Cribside Committee, known as "Cradyl-Nyst"
- 1894 Miss Ellen James Evans
Mrs. Henry G. Trevor
- 1895 Mrs. Evan T. Walker
Mrs. Richard Arnold, in memory of
Georgiana Arnold
- 1897 Mr. and Mrs. Charles M. Fry, known as the
"Mr. and Mrs. Charles M. Fry Bed"
- Mrs. George Kemp, "For the use and purposes of
the Hospital"
- 1898 Mrs. Oliver G. Jennings, known as the
"Brewster Bed"
- 1899 Mr. and Mrs. John Sherman Hoyt, in memory of
John Sherman Hoyt, Jr.
- 1900 Mrs. Elizabeth Chamberlin Lockwood, in memory
of Emily Beaver Chamberlin
- 1902 Mr. and Mrs. W. E. Dodge, in memory of
Grace Osborn
Henry P. Wertheim, in memory of
Clara W. Wertheim
- 1904 Mr. and Mrs. George Arents, in memory of
George Arents Brown
Estate of Mrs. Charles Harvey Hartman
- 1905 Mrs. J. Henry Lane
Mrs. Daniel S. Lamont, known as the
"Julia Lamont Bed"
- 1907 The Cribside Committee
- 1908 Arthur W. Butler, in memory of
Elizabeth Marshall Butler
- 1910 Dr. and Mrs. L. Emmett Holt, in memory of
Kenneth M. Holt
Edwin Clarence Moller, in memory of
Peter Moller
- 1911 Emily A. Watson, in memory of Wheeler Watson
Mrs. Bradley Martin, in memory of
David Bradley Martin
- 1912 In loving memory of J. Bradley Cumings,
endowed by his friends. "Greater love hath no
man than this, that a man lay down his life
for his friends." — *St John 15:13*
- 1914 Mrs. Andrew Carnegie, in memory of
Archibald Fraser Barrow
Mrs. Robert W. Todd, known as the
"Mabel Todd Bed"
- 1916 Mr. and Mrs. John Chandler Moore, in memory of
Edward de Bébian Moore

- Mrs. John Hubbard, in memory of
Margaret Fahnestock
Mrs. Clarence M. Hyde, known as the
"Clara Mathewson Hyde Bed"
- 1917 Harris Brisbane Dick, known as the
"Harris Brisbane Dick Free Bed"
Mrs. Edward S. Harkness, known as the
"Thomas Stillman Taylor Bed"
Mr. and Mrs. Walter A. Hirsch, in memory of
John Walter Hirsch
- 1919 Mr. and Mrs. Daniel Schnakenberg, in memory of
their daughter, Anna Kate Bartlett
Mrs. John Jay Knox, in memory of
John Jay Knox
Mrs. John Jay Knox, in memory of
Dr. Reuel B. Kimball
- 1920 Mrs. Andrew Carnegie, "A thanks offering for
Louise Carnegie Miller"
- 1921 Estate of Jacob H. Schiff
- 1922 The Cribside Committee, in memory of
Sarah Elizabeth Williams
Mr. and Mrs. Simon Guggenheim, in memory of
their son, John S. Guggenheim
- 1923 Mr. and Mrs. Herman Armour Nichols, "In loving
memory of Marie Louise Nichols"
- 1929 Estate of Julia M. Stout
- 1930 Edith C. Thompson, in memory of her mother,
Mrs. Grace H. Thompson
- 1934 West End Collegiate Church
- 1935 Estate of Daniel Schnakenberg, in memory of his
children, Daniel Schnakenberg, Jr., and
Marie Schnakenberg
- 1936 Estate of Carrie Guggenheim
- 1938 Estate of Emily S. Hornblower, in memory of her
stepdaughter, Susie Sanford Hornblower
- 1949 Dr. Frederic H. Bartlett, "Endowed in loving mem-
ory of Frederic H. Bartlett, M.D., 1872-1948, by
his patients and other friends to commemorate
his many years of faithful service in Babies
Hospital"
- 1950 Estate of Emelyn L. Coolidge, in memory of
Marianna Wheeler and Emelyn L. Coolidge,
M.D., to be known as "The Wheeler-Coolidge
Bed"
- 1957 Estate of Martha S. Reynolds, in memory of her
mother, Ernestine Schaffner

Neurological Institute

- 1929 Red Cross Endowed Bed for Nurses
Rivington-Dwyer Endowed Room for Nurses
- 1943 Alice Dunning Starr, in memory of her husband,
Allen Starr
- 1959 Mr. Jack J. Dreyfus, Jr., to be known as the
"Jack J. Dreyfus, Sr. Bed," in honor of his
father

MEMORIAL ENDOWED BEDS FOR RESEARCH PURPOSES

- 1952 Estate of John Bahrenburg, in memory of John H.
Bahrenburg and Elizabeth Bahrenburg
(16 Beds)

New York Orthopedic Hospital

- 1883 Miss C. B. Hicks, continued in perpetuity by
Buchanan Winthrop
- 1886 Mrs. Elizabeth Milbank Anderson, in memory of
J. Milbank Anderson (4 Beds)
- 1891 Alfred Corning Clark (3 Beds)
Edward Severin Clark, to be known as the
"Edward Severin Clark Beds" (2 Beds)
Mrs. Henry S. Winthrop
- 1893 Mrs. William D. Sloane, in memory of
William Douglas Sloane, Jr.
James K. Gracie, in memory of
Anna Bulloch Gracie
Miss Sarah B. Gibbs
- 1894 Mrs. Richard Tylden Auchmuty, in memory of
Richard Tylden Auchmuty (2 Beds)
James H. Jones
- 1896 Mrs. William Astor, in memory of
Helen Roosevelt
Mrs. Evan T. Walker, in memory of
John J. Walker
- 1897 Mrs. William D. Sloane, one bed in memory of
Maria Louise Vanderbilt and one in memory of
Emilie Vanderbilt Burden
- 1898 Mrs. Charles B. Alexander, for her daughter,
named the "Harriet Alexander Bed"
- 1901 Mrs. N. A. Baldwin, in memory of
Louise Suydam Duer
Mrs. Benjamin Brewster, in memory of
Benjamin Brewster
Henry T. Sloane, Jessie and Emily Sloane, bed
endowed by their father
Mrs. Marion Story, in memory of
M. Furman Hunt
- 1902 James Henry Smith, in memory of
George Smith (2 Beds)
Miss Emily A. Watson, in memory of
Mrs. Mary J. Walker
- 1904 Miss Cornelia Prime, in memory of her brother,
Temple Prime
Miss Helen Phipps
James K. Gracie, in memory of
Esther Gracie Ogden
- 1906 Miss Caroline White
Mrs. M. Dwight Collier, in memory of
Maurice Dwight Collier
- 1908 Mrs. H. N. Munn, Mrs. Augusta Munn Tilney and
Orson D. Munn, in memory of Henry
Norcross Munn
- 1911 Estate of Everetta C. Whitney
Miss Josephine C. Smith, in memory of her father,
Dr. Edward A. Smith, and her mother,
Rebecca Miller Smith
- 1913 Estate of Marion de Forest Clark, in memory of
Julian Bouton Clark
An anonymous donor, to be known as
"Mary Townsend Cuyler Bed"
Carolina F. Butterfield, in memory of
Frederick Falconer Butterfield
- 1915 Miss Emily Trevor
Mrs. Frederick W. Vanderbilt, to be known as
"The Louise Bed"

- George Grant Mason, in memory of his uncle,
James Henry Smith (2 Beds)
- 1916 Henry M. Tilford, in memory of
Catharine Hunt Tilford
Estate of Miss Clementine Furniss, to be known as
the "Clementine Furniss Bed"
An anonymous donor
- 1917 Mrs. Charles H. Senff, in memory of her little son,
Henry Senff
Mrs. A. Murray Young, in memory of her great
uncle, Wilson G. Hunt
- 1919 R. Fulton Cutting, to be known as the
"Helen Suydam Cutting Bed"
Mrs. Frederick Delano Hitch
Levi P. Morton, in memory of
Anna Livingston Morton
Miss Georgiana G. R. Wendel, "In Memory of
My Sister, Augusta A. S. Wendel" (2 Beds)
Various donors, in memory of
Theodore Roosevelt
- 1920 Mrs. John Hobart Warren
- 1921 Mrs. Winthrop W. Aldrich, in memory of her little
son, Winthrop Williams Aldrich, Jr.
F. Ambrose Clark, to be known as
"The Florence L. Clark Bed"
- 1922 Mrs. David T. Dana, in memory of her mother,
Mrs. M. Dwight Collier
- 1924 Estate of Charlotte Bruce Bickmore, in memory of
Albert Smith Bickmore, Jr.
Mrs. Louise Ward McAlister Lewis, in memory of
her mother
- 1925 Miss Elizabeth J. Hofer, in memory of
Horatio C. Kretchmar (2 Beds)
Percy Chubb, in memory of his wife
Junior Red Cross of the Public Schools
of New York
Mrs. Douglas Robinson, in memory of her friend,
Charles Allen Munn
- 1926 Junior Red Cross of the Public Schools
of New York
- 1927 Darrach Home for Crippled Children, in memory
of Dr. May Darrach
- 1928 Mrs. Mary L. Schoonmaker, in memory of
Sylvanus Lothrop Schoonmaker and
Frank Layng Schoonmaker (10 Beds)
Estate of Henry D. Dickinson, in memory of
Hathaway M. Dickinson
- 1930 James T. and Sarah Bancroft Leavitt, to be known
as the "Mrs. James T. Leavitt Bed"

- 1934 Henry C. deRham, Frederic F. deRham and
Clarisse deRham Rutherford, in memory of
their parents, Charles and Emily Howe deRham
- 1935 Mrs. Percy R. Pyne and family, in memory of
Meredith Howland Pyne
- 1936 Miss Elizabeth Stewart Hamilton, in memory of
Mrs. John Hobart Warren, to be known as the
"Harriette Mott Warren Bed"
Mrs. Edward S. Harkness, to be known as "Dorcas
House Bed" in dear memory of Wilma Gideon
- 1938 Miss Grace Howard Potter, to be known as the
"Howard and Mary Louisa Potter Bed," in
memory of her father and mother
- 1955 General and Mrs. E. F. Maude, in memory of
Mrs. Maude's father, Robert I. Brewster
Estate of Carrie Rosenshine, to be known as "The
Lillie Rosenshine-Marjorie L. Kaufman Bed"
- 1956 Estate of Adolph Riesenbergs, to be known as "The
Adolph and Anna R. Riesenbergs Bed"

ENDOWED ROOMS

- 1922 Glenn Ford McKinney, a ward room in the
country branch, in memory of his wife,
Jean Webster McKinney
- 1929 400 of his friends and associates, a room in the
private pavilion, in memory of H. Le Roy von
Lackum, M.D., surgeon in this hospital,
1916-1928

Institute of Ophthalmology

(Including Herman Knapp Memorial Eye Hospital)

- 1883 Mrs. Oswald Ottendorfer
- 1884 Miss Henrietta A. Lenox
- 1895 Miss Mary Morris van den Heuval
- 1897 Mrs. Giovanni Ceccarini
- 1913 Miss Catherine A. Bliss
Miss D. Willis James
- 1918 Truman Peck Stone
- 1921 Miss Rosie Bernheimer, in memory of her parents
- 1923 Miss Mary Wiley, in memory of her brother,
George Wiley
- 1928 Mrs. Matilda Townsend Palmer
- 1931 Leo Doblin
- 1936 Charles M. Brooks
- 1957 Mortimer and Harriet M. Marcus Foundation,
Inc., to be known as "The Mortimer and
Harriet M. Marcus Endowed Bed"

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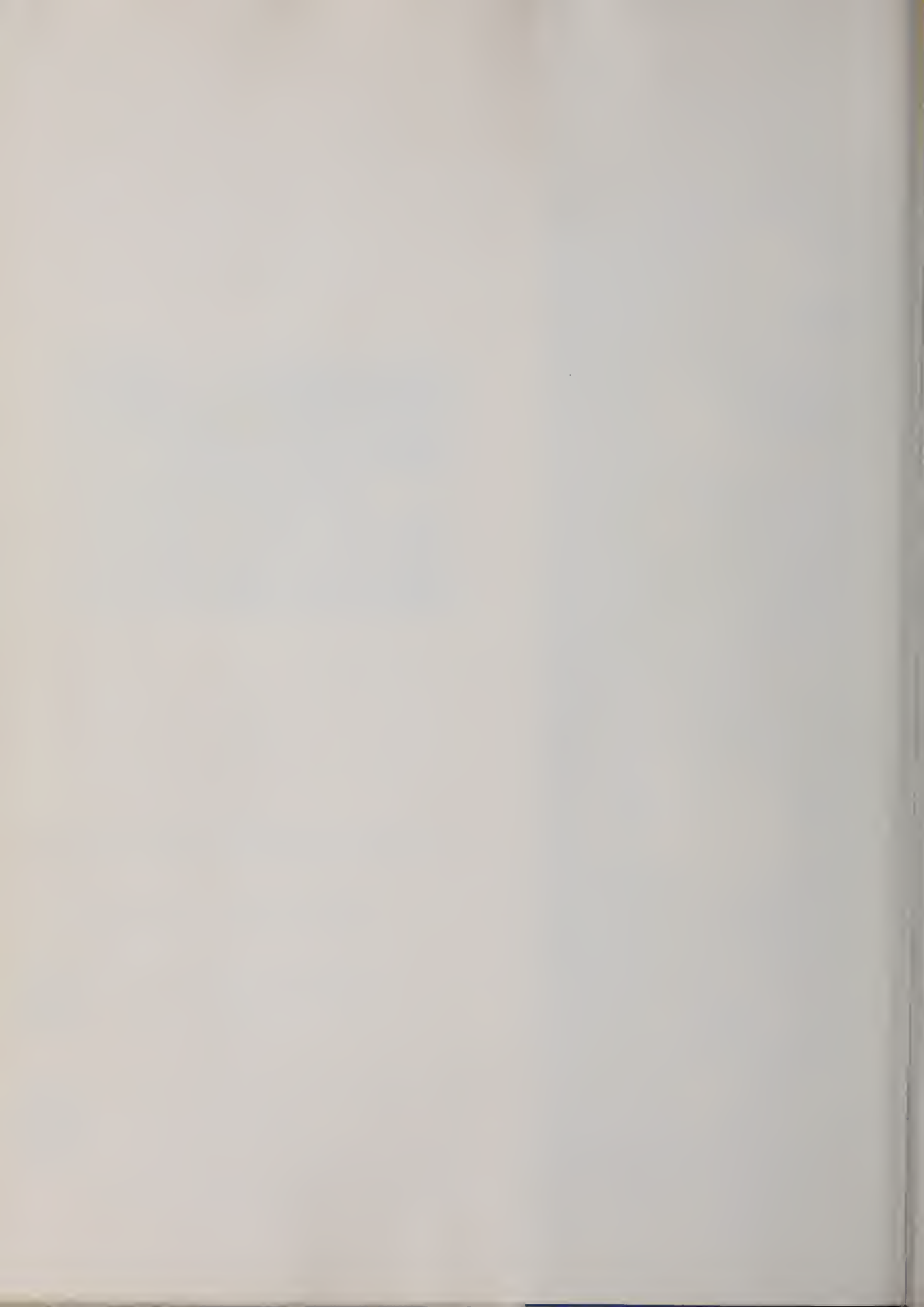


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